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For the Southern Agriculturist.

REMARKS ON MR. RHETT'S ADDRESS, AND MR. ELLIOTT'S EXAMINATION OF IT:

BY WILLIAM WRAGG SMITH.

(Concluded from page 458.)

EQUALITY OF PRODUCTION.

No. 1.—"*Who is the Producer*?"—An Address delivered before the Beaufort Agricultural Society, by Edmund Rhett, Esq., August, 1840.

No. 2.—Examination of Mr. Edmund Rhett's Agricultural Address, by Wm. Elliott, Esq.

Our argument goes no further than to maintain the general equality of production; but we might ask here, whether these cultivators of the arts would not produce more than the cultivators of the land, taking the illustration of the five boys, and supposing three out of the five to be in the one or the other way employed? The difference would be that the majority of agriculturists would import money or other products for their products, and so far be possessed of wealth; but in proportion as there were fewer products or enjoyments among them upon which to bestow their surplus income, or these dear, they would either disburse much of their money abroad, or be curtailed of so much real wealth, if they remained at home. The cotton and rice which they would produce, would have no quality in themselves which would invite the disbursement of money from other countries, though, as so much capital in the community, they would invite and give support to merchants, artificers, professions, &c. But the majority of artists, comprising every art in perfection, which can cater to the appetite of the universal master consumer *Ennui*—filling up every chink in the measure of enjoyments, (the necessaries and conveniences of life being at the same time amply furnished) would amass individual wealth from foreign sources likewise, which would also be so much capital maintaining agriculture, manufactures, professions and arts reciprocally. But their community would have an additional gain. Their products, like manufactures, would be exclusive of the land; and they could support a much greater population. They would possess in themselves a peculiar value, over and above their actual money value—that quality of inviting *individuals* as well as money values; and those individuals cheifly persons of fortune—large dis-

bursers; and of retaining at home the native wealth of the community: for wealth clings to the circle of enjoyment, refinement, and fashion, like the leaf to the eddy.

"Some of the best English writers upon commerce," remarks Adam Smith, "set out with observing that the wealth of a country consists, not in its gold and silver only, but in its lands, houses, and consumable goods of all kinds. In the course of their reasonings, however, the lands, houses, and consumable goods seem to slip out of their memory, and the strain of their argument frequently supposes that all wealth consists in gold and silver, and that to multiply these metals is the great object of national industry and commerce." *

We may impute the error of much of Mr. Elliott's argument to this slip of the memory. It would be the same thing to the rice or cotton planter, whether he sold his rice or cotton to the merchant who exports these productions and brings back in their lieu other commodities, and purchased with the money all the necessaries, conveniences, and enjoyments, which he stood in need of, at home; or whether he directly exchanged his rice or cotton for these consumable goods. The object of foreign commerce is not to accumulate *gold and silver*, but to exchange one production for another—to accumulate *goods*. If all goods could be accumulated at home, a people would be as wealthy as they could be. By increasing the quantity of goods they would increase their wealth—they could command any amount of gold and silver. But they are wealthier in proportion as they increase the variety as well as the quantity of goods. All the classes which have been called unproductive, contribute to this real wealth, some, as has been shewn, by their instrumentality—others, by producing objects of desire, which, as they are exchangeable at home, are, many of them, not unsusceptible of demand abroad also—many, by adding, through their competition, and the cheapness of commodities, to the real value of the income of society—all, by rendering home the more attractive, and causing disbursements at home.

No fact can be plainer than that by the disbursement of a fourth of a nation's gross revenue abroad, it loses a fourth of its wealth. So many goods are displaced—so much production is stifled.

We think it must be difficult to show any distinction between the producer of opium or tobacco, and the ballad-singer, or opera dancer. Both employ capital and labor†—both produce commodities which may entice money out of other's pockets—both gratify the senses; and the chewer of the intoxicating drug is a loser of "so much substantial wealth," with no equivalent but a "dream like recollection," equally with him who goes to see the *Cracovienne;*

* Wealth of Nations, vol. ii., b. iv., ch. i., p. 173.

† See the former part of the argument on this point in a previous number of this journal.

and the consumer of segars would see his dollar dissipated into smoke by the grower of tobacco, as soon as the lover of music who has exchanged his for a sound. Nothing would prevent the grower of opium or tobacco from carrying away out of the State, a considerable portion of the wealth thus subtracted from others. The thing is done every summer by our planters. The merchant exports rice to the Havanna and brings back to Charleston segars. The effect upon the consumers of segars is the same precisely as if the rice planter directly made himself rich at their expense.

But when we contend that these classes are producers, we mean, of course, that they should belong to the society – should reside in it. Foreigners—strollers from place to place, could not come under the denomination in the same sense as agriculturists, manufacturers, and merchants, whose lands, houses, and goods, or their values form the wealth of the society, or other classes who disburse and give fresh employment in their society.

The planter who is an absentee would keep in motion or might improve the value of land and labor in the State, and give a certain amount of employment to agents, merchants, &c. He would also produce taxes to the government. But the nett value of his products would be lost to the State; it would be so much taken out of the pockets of the rest of the community; for his rice or cotton exported would return in the shape of diffirent consumable commodities, necessaries, and luxuries—the price of which would not return; but he would have it in his pockets to spend abroad.

A hunter who supplied our markets with venison, would, upon Adam Smith's principles, be undoubtedly a producer; but we should scarcely term such, upon the principle now in question; the yankee who comes from the north, and pitches his tent during the winter months amid the Santee swamps—supplies us with wild-ducks, and in a short space of time is off with so much of our money. The strolling player is like him. But if we make equal the circumstances which invite to the culture of the land, and to the support of a permanent theatre in the City of Charleston, though manager and corps should carry away the greater part of the money which they had accumulated, they would necessarily spend more of it in the same proportion than the absentee planter would of his: and all the while the theatre, like the land, would exist, a value susceptible of improvement—attached to the community, and would give employment to trades, arts, and labor connected with it. The proprietor of this theatre would be like the builder of a house, or a manufacturer employing foreign workmen—with this difference, that with the theatre, the greater portion of the profits go to the workmen – that is the performers, and they would disburse more of it than mechanics and laborers, during their stay. If the capacity to be taxed is a test of production, theatres and artists are in no degree inferior to lands and negroes in

this respect. A licence is a heavy tax, and a considerable portion of the funds of cities and corporations is derived from such sources. There are taxes on stock in trade, and on the profits of professions.

But we are told: *it is the producer—the planter who really pays these taxes:* they are charged in the price of these amusements—in the price of goods consumed by him—in the fee-bill for professional services.

It is in his character of consumer, and not of producer that the planter may eventually pay some of these taxes. All taxes fall upon the consumer, or the class which may be so considered—with whom demand rests. If government imposed a heavy direct tax on lands and negroes, agricultural products—all consumable goods brought to market by slave labor, would be increased in price: for the tax would increase the cost of production; and those planters &c. who were not possessed of the best lands, and most favorable circumstances for profits, would otherwise dispose of their capital and labor, or, the same demand for their products existing, the supply would be diminished, and the tax would be added to the price, to enable the same quantity to be produced. The unproductive classes, so called, would be charged by the planter—by the employers of the land and labor thus taxed, with the tax in the price of the necessaries they consume; and the lawyer, the physician, the artist, &c. would have more reason to complain, and could with greater justice retort upon these producers this argument against production; because the tax on necessaries which the consumer pays, is often repeated or accumulated several times. If corn is high, labor will be high, and if the labor is taxed likewise, it will be still higher. The manufacturers will have to advance the price of *their* goods in proportion to the diminution of profits they would sustain from these causes. If *their productions*—the goods themselves are likewise taxed, for instance—leather, salt, soap, candles, the consumer would have to pay not only for the tax on the leather of his own shoes, but for a part of that upon those of the shoe-maker and tanner. He would have to pay besides for the tax upon the salt, the soap, and the candles consumed by those employed in his service, and for the tax upon the leather which the salt maker, the soap-maker, and the candle-maker consume.

Whereas, the tax on professions, on immaterial labor, and amusements, is paid in one simple instance, and has more the character of a tax on luxuries. Because the physician may have included his tax in his bill to the lawyer, and the lawyer, by patronizing a company of artists enables it to pay the licence, the lawyer does not dream of charging a proportion of the physician's tax, and a portion of the sum which he has voluntarily contributed towards his amusement, in his fee-bill to his client; but he may simply add to his fee what the tax would take from his profits.

There is perhaps, too, this difference between the tax on the ne-

cessaries, and the tax on the conveniences and enjoyments of life. The former *must* be charged, or production must cease; for it depends upon a *certain cost*, more than upon increased demand. It is not so much in the power of the farmer or manufacturer to sell cheap in order to secure a number of customers. There is a fixed point—the cost of production, which levels him with his fellow producers. But the lawyer or physician depends more upon *increased demand*—upon *the extent of his practice*, than upon any absolute cost of production. If a physician could secure two patients, or a lawyer two clients instead of one, by making no charge of the tax, it is much to his interest evidently to pay the tax himself. If the tax were ten per cent on his profits, it would be his object rather to pay twenty per cent, and realize two hundred dollars, than to realize only one hundred and ten. The deduction at first would be only from his present means; it would not cause him to shut up shop. There would be no great, urgent expenses requisite to the carrying on of his business, by which he would be obliged to regulate his fees.

A carriage maker is classed among producers and is so considered by Mr. Elliott, because he creates a money value—a material value—and adds something to the wealth already existing in the world. But because a tax on carriages offered for sale is added to the price and amounts in fact to a tax upon other producers who use carriages, this does not prove the carriage maker to be less a producer—to be a mere accumulator of the wealth of others. No more is a vocalist, or a raree-showman less a producer because he fixes his price of admission according to the expenses he is put to, and the tax he has to pay, and this price is paid by those who are willing to pay it for the amusement. In both instances the object sought is a luxury; and the production of luxuries constitute half of a nation's wealth.

If therfore, as we have endeavored to prove, the classes hitherto considered unproductive, assist materially in increasing the revenue of the society by their direct or indirect agency in the acknowledged products of the land and labor of the country—as parts in the general division of labor; by producing actual values not distinguishable from material values—the objects of exchange as much as food or clothing—which so far from merely changing so much wealth into different hands, change only so much currency, and on the contrary, increase wealth by increasing production, and eventually add to the circulating metals; by stimulating production generally through the incentives they offer to industry; and by increasing the quantity of the conveniences and enjoyments of life, at the same time, by their competition increasing the facility and means of obtaining them, add to the real wealth of the society;—and, if, with these qualities, their exchangeable products are not less valuable than products which are exported, and they are capa-

ble of affording a revenue from taxation, like other labor—let us not deny to them all the essentials of production.

Before we conclude we must offer a few remarks upon the following passage: "Away, from this date henceforth, with all fears of individual and national distress! While any product of value remains to an embarrassed household, it has only to be indefinitely exchanged to be indefinitely multiplied!! And as for Nations! Here is a spell of potency to lay the spectre of Bankruptcy forever! The minister of finance, sitting with his fellows round the council board, has only to exchange the public treasury—or the national domain—for any proffered 'equivalent'—even were it for unsubstantial 'immaterial services'—and Presto!—New wealth is generated for the service of the State—new navies ride in her roadsteads—new armies spring to her defence, and Plenty pours her full horn of blessings over the smiling land!"*

If an embarrassed household had only one dollar, the question would be the same, whether to increase that dollar twenty or an hundred fold, to enable the individuals composing that household to have the wherewithal to relieve their embarrassment—or whether by their mutual assistance, to furnish directly to one another the things which each individual needed. One might set about to furnish the requisite quantity of food; another the requisite quantity of clothing and utensils; one would be appointed to protect the household from robbery and to distribute equally the food, clothing, &c.; another to perform the menial offices, and save so much time to the other branches of the household. By the proper distribution of such employments, the household would soon find itself supplied with all necessaries and conveniences; but after this, its production would remain stationary, unless some one could invent a new production which would create a new want. Suppose this one to be a new member of the household who brought with him some innocent art which would alleviate the tedium of labor and give new springs to industry. The support which they would give him would be compensated by the increased production he would occasion.

As we have before hinted, it must not be retorted that the art may be pernicious, and have the contrary effect of enfeebling the energies of the society; for many products of the land are injurious likewise, and many manufactures hostile to the welfare and morals of a community. It is often a question in political economy, whether a certain production or trade is more pernicious than advantageous to industry; and there are arts and employments, both material and immaterial, which, however objectionable in a moral point of view, and reprehensible by themselves under the liberal and intellectual aspect with which we think we should correct our too material notions of political economy, regarding it as an enlightened science, which treats of other wealth than the mere wealth of

* Examination (Southern Agriculturist,) June, p. 284.

goods and chattels, yet we should hesitate to pronounce the foes of dollars and cents; for, while they seem unfavorable to industry in one way, or in their immediate effects, they frequently promote it in another, or in the long run.

If the household, by indefinite exchanges of mutual wants—of consumable commodities, may indefinitely multiply the real value of the only real property it has, which is its labor, and exchangeable skill, its wealth may be indefinitely increased; and the dollar, which we supposed to be the only remaining article of value, might be thrown into the sea.

If we suppose the household isolated from the rest of the world, to have gone about, in the first instance, to multiply the dollar, instead of its exchanges or consumable commodities, would have been as wise as to have set about multiplying the number of its cooking utensils, when it was embarrassed for the victuals to cook—and if it was not thus isolated, it could not, by honest or effectual means, multiply the dollar in any other way, save by multiplying the exchanges (not of the dollar) but of its necessaries, conveniences, and enjoyments.

Or the answer may be thus:—If the remaining product of value be food enough to support the household for a year, in proportion as this food is exchanged among them for a greater or a smaller quantity of other cousumable products, the resources of the household to purchase an additional quantity of food would be greater or less—or, the food *indefinitely exchanged*, would be *indefinitely multiplied*.

The minister of finance, were he like the Spaniard of old, who judged whether a country was worth conquering, by the quantity of gold and silver which was to be found in it, might deem it expedient to multiply and hoard up specie in the public treasury, rather than exchange it for *(unsubstantial?) immaterial* services; but we think Mr. Elliott must agree with us in acknowledging the Tartar's standard of wealth to be the more correct one, who believes it to consist in the number of cattle. *We* should say, in the number of *productions*—and in the proportion in which material productions, and national character (which is a species of wealth) are amplified and ennobled by immaterial or intellectual productions.

We would understand by *exchanging the national domain for immaterial services*—the sale of portions to provide a fund for the employment of armies and navies when called into service for the defence or aggrandizement of the nation; (for we may consider these as immaterial services, as well as the services more strictly so since they combine moral and intellectual with physical requisites;) and as these portions, when thus brought into cultivation, would be capable of paying a tax to the government, the "product of value" would be twice exchanged, as it were; and the value of the fund "multiplied," while the "equivalent"—the "immaterial *(unproductive!)* services of the army and navy might produce a

value far greater than that of the fund employed—a whole country might be saved from destruction, or a nation made tributary.

By something similar, too, we understand the most convenient and efficient method by which our State legislature would set on foot those measures of agricultural improvement and extension, the importance of which legislation, in striving to impress upon that body, first led Mr. Elliott to the repetition of these old doctrines which Mr. Rhett has denounced.

Heartily concurring, as we do, in Mr. Elliott's views in this particular, we do not see that there is any other just principle or practicable mode by which the landed interest of the State can be promoted, and agricultural bounties, surveys, schools, reports, internal improvements set on foot, than that which would amount in fact to an exchange of so much domain for these "proffered equivalents"—of so much of the value of the land, for the improvement of the land—for these "immaterial services." It would be contrary to our notions of fair and impartial legislation, to levy taxes indiscriminately on all classes of industry, in order to favor a particular class. The land, then, must pay for itself. So much land must be given up as a compensation—as a nucleus upon which to form these concentrated operations, by the means of which the whole revenue of the land will be increased; and if, at each operation, so much of this value be exchanged for new equivalents, with a corresponding benefit at every exchange, production must be multiplied.

We need no stronger exemplification of the direct agency which immaterial labor exerts in the raw material of the land, of which we have spoken before, than the benefits which would accrue to the land from the direct employment of the immaterial services of geologists, surveyors, agricultural professors, (including chemists, botanists, meteorologists, entomologists, mineralogists,) officers of public works, &c. who would replace the fund destined to their maintenance and profits, and add to the profits of their employer the State, or of the capital thus invested, besides increasing the revenue of agriculture generally, and the resources of the land in those treasures which may be hidden beneath its surface.

We may now close the argument with Mr. Rhett's conclusion—"*that all labor is alike productive, though production in different proportions, and that the distinction of the classes of laborers into productive and unproductive, has no foundation in fact, and is equally condemned by reason and experience.*" And we do not mean to dispute the *fact* that in an agricultural State like this, agricultural labor is the most productive in the *bulk* of its productions compared with with the bulk of other productions, and that the bulk of taxes is paid by the agricultural interest; but only the *theory* which attributes to agriculture *in the abstract* superior productiveness, and denies to the other classes of industry which we have enumerated, superior productiveness *in the concrate*—denies that all labor in the abstract is alike productive, and only in proportiou to demand.

For the Southern Agriculturist.

IMPROVED BREED OF NORTH DEVON CATTLE.

Mr. Editor :—Being under the impression that the North Devon is the only improved breed of cattle that can profitably be introduced into our Southern Atlantic States, I have taken the liberty of sending you a few extracts from Mr. Youatt's work on British cattle, and Loudon's Encyclopædia of Agriculture, in the hope that they may induce some of our planters to improve their stock, and assist them in the selection of a suitable breed. He says that "their qualities may be referred to three points, their working, fattening, and milking. Where the ground is not too heavy, the Devonshire oxen are unrivalled at the plough. They have a quickness of action, which no other breed can equal, and which very few horses exceed. They have also a degree of docility and goodness of temper, and also stoutness and honesty of work, to which many teams of horses cannot pretend. Vancouver, in his survey of Devonshire, says that it is a common day's work on fallow land for four steers to plough two acres with a double furrow plough. Four good Devonshire steers will do as much work in the field or on the road, as any three horses, and in as quick, and often quicker, time, although many farmers calculate two oxen to be equal to one horse. The principal objection to the Devonshire oxen is, that they have not sufficient strength for tenacious clayey soils; they will, however, exert their strength to the utmost, and stand many a dead pull, which few horses could be induced or forced to attempt. They are uniformly worked in yokes and not in collars.

"Their next quality is their disposition to fatten, and very few rival them here. They do not, indeed, attain to the great weight of some breeds; but, in a given time, they acquire more flesh, and with less consumption of food, and their flesh is beautiful in its kind. It is of that mottled, marbled character, so pleasing to the eye and to the taste." He details three experiments made by the Duke of Bedford, of fattening them, along with steers of the Hereford, Sussex, Liecester and Glamorgan breeds, in all of which they proved themselves the best.

"The North Devon oxen are rarely shod and very rarely lame," and in a note, he adds, "A writer in the Farmer's Magazine, Mr. Herbert, thus describes the Devonshire ox: "nimble and free, out-walking many horses, healthy and hardy, fattening even in a straw yard, good tempered, will stand many a dead pull, fat in half the time of a Sussex, earlier to the yoke than steers of any other breed, lighter than the Sussex, but not so well horned, thin fleshed, light along the tops of his ribs, a sparkling cutter, and lean well intermixed with fat." Of the cow, Mr. Herbert says, "very quiet,

the playmate of the children, a sure breeder, a good milker, a quick fattener, fair grass-fed beef in three months."

For the dairy, the North-Devons must be acknowledged to be inferior to several other breeds. The milk is good, and yields more than an average proportion of cream and butter; but it is deficient in quantity. There are those, however, (and no mean judges,) who deny this, and select the North-Devons even for the dairy.

Mr. Conyers, of Copt Hall, near Epping, a district almost exclusively devoted to the purposes of the dairy, preferred the North-Devons on account of their large produce, whether in milk, butter, or by suckling. He thought that they held their milk longer than any other sort that he had tried—that they were liable to fewer disorders in their udders, and that being of a small size, they did not eat more than half what larger cows consumed. He thus sums up his account of them: "Upon an average, ten cows give me five dozen pounds of butter per week in the summer, and two dozen in the winter. Mr. Rogers, veterinary surgeon at Exeter, and to whom we are indebted for some valuable hints, says that the quality of the milk is good, and the quantity remunerating to the dairy-man." Such, however, is not the common opinion. The Devonshire cattle are said to be more than usually free from disease, and Loudon, § 6843, says, "Perhaps Devon calves surpass all others as sucklers, whether for quickness of proof or beauty of the veal. I will conclude by summing up the arguments in favor of moderate sized animals, while those who wish it, can find the arguments in favor of the large sized summed up in Loudon's Encyclopædia of Agriculture, § 4838. Of late, since breeders began to calculate with more precision, small or moderate sized animals have been generally preferred for the following reasons:

Small sized animals are more easily kept; they thrive on shorter herbage; they collect food where a large animal could hardly exist, and thence are more profitable. Their meat is finer grained, produces richer gravy, has often a superior flavor, and is commonly more nicely marbled or veined with fat, especially when they have been fed for two years. Large animals are not so well calculated for general consumption as the moderate sized, particularly in hot weather; they are not so active, require more rest, collect their food with more labor, and will only consume the nicer and more delicate sorts of plants. Small cows of the true dairy breeds, give proportionably more milk than large ones. Small cattle may be fattened solely on grass of even moderate quality, whereas the large require the richest pastures, or to be stall-fed, the expense of which exhausts the profit of the farmer. It is much easier to procure well shaped and kindly feeding stock of a small size than of a large one. The small size sell better—for, a butcher, from a

conviction that in proportion to their dimensions, there is a greater superficies of valuable parts in a small than in a large animal, will give more for two oxen of 12 stones, each, per quarter, than for one of 24 stone.

Davis, of Longleaf, one of the ablest agriculturists England has produced, laments that the attempts which have been made to improve the breeds of cows, horses and sheep, have proceeded too much upon the principle of enlarging the size of the animal, whereas, in general, the only real improvement has been made in the pig, and that was by reducing its size, and introducing a kind that will live "hardier, and come to greater perfection at an earlier age."

I would call the attention of all planters desirous of improving the breeds of domestic animals, very particularly to the remark of Mr. Davis; for if there are such good reasons why moderate sized animals should be preferred in England where the climate is moist, the pastures very luxuriant, and where particular attention is bestowed upon providing roots, &c. for cattle, they surely will apply with more than double force to our country where no care whatever is taken of our cattle, and where the climate is hot and dry and the pastures poor. And if there are a great many counties in England where the Short Horns cannot be kept, with all their care, how is it possible for us to keep them? Our climate also appears peculiarly unfavorable to the Durhams, for few even survive the first year. Last spring a part of my calves were from a half Devon bull and a part from a half Durham bull. Those from the Devon were decidedly superior in appearance, being fat and muscular, while those from the Durham were lean and bony; and they are still in the same relative conditions. So satisfied was I of this, that all my calves next year will be from the half Devon bull.

For the Southern Agriculturist.

REPORT OF ST. ANDREW'S AGRICULTURAL AND POLICE SOCIETY, JAMES ISLAND.

At the quarterly meeting of the St. Andrew's Agricultural and Police Society, held on James' Island the 5th inst., the following report was submitted by the Committee on Agriculture, and on motion, received and ordered to be published in the *Southern Agriculturist.*—

"Your Committee beg leave to report, that in discharging their duty, they have devoted three days, commencing on the 30th ult., riding through and carefully inspecting the various crops of the members, in the different sections of the Island. The Cotton

crop they find, which was backward in the early part of the season, has been materially injured by frequent deluges of rain during the months of August and September, too much moisture producing a diseased plant, causing the forms to cast at first, and more recently a drying up of the bolls. The numerous crops visited differ of course widely in the yield, some averaging as low as fifty pounds per acre, while others will reach fully one hundred and twenty pounds per acre. From the quantity of Cotton already picked in, and appearance of the fields at this time, your Committee are induced to believe this Island will average eighty pounds clean Cotton per acre.

"The Corn crop, which is now all housed, and notwithstanding the turn out, does not come up to the promise from its appearance at one period of the season, your Committee are pleased to say, is more abundant than it was the past year.

"The Root Potato crops, with but very few exceptions, your Committee have found to be unusually bad. The Slip crop, however, looks well and promise a good yield.

"In conclusion, your Committee take leave further to remark, that by our exemption from storms, the great degree of health that has existed on our plantations, and the Island generally, the members of this Society have abundant cause for gratitude to a bountiful Creator.

"All of which is respectfully submitted.

"J. B. HINSON,
"*Chairman Agr. Comm.*"

ON SHELTER FOR CATTLE AND SHEEP.

Messrs. Gaylord & Tucker,—In the June number of the Cultivator, I find a communication from James M. Garnett, of Va. in which he propounded some questions In reference to the one, "which is best, to shelter or not to shelter sheep and cattle from snows and cold rains?"—I would say, that about the year 1817, I commenced the winter in Onondago county, N. Y., with a small flock of sheep, mostly of the native breed, and no other shelter than what nature provided. The country was then comparatively new, and the improvement, (if improvement it could be called,) on the farm on which I had then but recently settled, was small and made by girdling the large, and clearing out the small timber and bushes. In this situation my sheep increased and did well. I was rather inclined to the "let alone system" of which your correspondent speaks, and went on without providing shelters. I bought, sold, raised and soon began to lose some, till in about nine years, I had something over 150 in my flock, mostly a mixture of the native and merino breeds.

During this time the country had undergone an essential change; the improvements had much extended, and the girdled timber had nearly disappeared. The bleak winds of winter, frequently laden with snow, came heavily upon us, and in the winter of 1826–27, which was distinguished for the long time snow lay upon the ground, my flock was reduced more than one-third, that is to less than 100. I was not sensible that I did not take as good care and feed as well as formerly, when more successful, but all to no purpose, the sheep would die for all that. I consoled myself that it was a season of uncommon mortality among sheep every where, as many of my neighbors lost near or quite the same proportion of their flocks that I did; and from Vermont to Ohio, there were accounts of the same fatality attending the flocks of the woolgrowers. So I still continued on without shelters for sheep, and my loss continued to be large in proportion to the number that I kept, till at length driven—yes, absolutely driven from my prejudices, I began to try shelters, and having followed that plan for several years, I am now persuaded, that with good shelters and good suitable food and *attention*, there is not much if any more danger of loss in wintering than in summering sheep; at least my experience shows such is the result.

Cattle and sheep will frequently leave good hay, if placed in exposed situations, in hard storms, for their shelters. If they choose their shelters rather than remain out long enough to fill themselves with good food, is it not unmerciful and bad policy, to compel them to remain constantly exposed to the severity of such weather. I am aware there is a difference between the climate here, and in Virginia, and do not know that shelters are as imperatively necessary there as here, but still think they must be decidedly beneficial. Here, sheep and cattle appear to suffer as much from the storms of sleet and rain in the spring, when the season is not colder than the winters in Virginia, as they do in the cold snow storms of our winters.

Having tried several kinds of shelters, I will here give an opinion of the kinds that are to be preferred. Good sheds attached to barns are probably the best, or on sideling and dry situations, good shelters may be made under barns, which I think a very economical method of building. Supporting roofs, make a large item in the expenditures necessary for farm buildings, and where shelters are formed under other buildings, this expense is saved. Permanent shelters made in this way, should not be less than about seven or eight feet high. If made low, it occasions great inconvenience when getting away manure; also when taking care of cattle, and especially sheep and lambs in the spring season, when much attention is necessary, and when the greatest amount of manure in the year will have accumulated. Beside the convenience, I think the health of animals, particularly sheep, is better promoted

by a high rather than a very low shelter, where the air must be more confined, and consequently less pure. But there are many others besides myself, who are not able immediately to have all the good and permanent shelters that are necessary; I will therefore describe a temporary kind which I have found very convenient for sheep.

Two sills only of light and durable timber, about eight inches thick before being worked, are used, and these serve for runners also. They should be about 15 feet long, the lower side left round, the upper side straightened by hewing, and trimmed down the other way to about five inches thick.—The ends should be hewed off on the under side, so as turn up something like runners. Thus prepared they may be placed about ten feet apart, from outside to outside of the timber. Four posts, or one for each corner of the building should be set about eighteen inches from the end of the sills, which will make the building about ten by twelve feet square. One girt for each end only should be used, of smart timber, and large enough to hold to draw the building by; and be framed into the posts about six inches above the upper side of the sill. This elevation is necessary in order that the building may be moved over uneven ground, or through snow; and the boards or siding should not run below the girts. The posts for the front, or open part, should be about four feet long between tenons, or from the upper side of the sill to the plate, and from the backside two feet. Three sides of the frame should be covered with thin, light boards, and the highest side left open. A loose board may be fitted down at each end to close the space below the girt, and removed whenever it is desirable to remove the building. Sheds of the above description may be moved easily by one pair of oxen or horses. Larger ones I have found to be heavy and uncomfortable to move; I think it better to enlarge the number than the size. But neither good shelter and good food alone will make healthy and fat animals, without regular feeding. The breeder of animals, whether cattle or sheep, will find that the attention necessary to ensure success, will always be amply repaid by the fine condition and rapid improvement of his flocks and herds. Levi Deming.

Otisco, 1840. [*Albany (N. Y.) Cultivator.*

KEEPING CATTLE WARM IN WINTER.

Mr. Allen Putnam—Dear Sir,—I observe by the papers that the subject for discussion at your agricultural meeting this evening, is Live Stock. If I were present, I would say something on the importance of keeping neat cattle and sheep warm in the winter season; but as I cannot be there, I will add ess a few words to you on the subject; and if you shall regard what I write as calculated to make the farmer's stock more comfortable and more profitable to its owner, you may publish this letter in the New-England Farmer.

When I commenced farming, I prepared a good barn-yard, enclosed with a close fence, and a well of water therein, covered with a shed. I used to turn out my cattle in the morning, and suffer them to remain out all day, unless there was a severe storm. The cattle were fed at noon with some coarse fodder spread on the snow in the barn-yard, or in racks under the shed. A plentiful supply of water was kept constantly in a trough in the yard. Now, sir, for years I thought that this was the best way I could manage. I have since adopted a different course. My cattle are fed several times in the morning, and carefully carded; and at about 9 of the clock are turned out to water. While the cattle are drinking, the stalls are cleaned out and littered, and in about one hour the cattle are again tied up. If the weather is stormy or very cold, they are permitted to return to their stalls as soon as possible; but if the weather is mild, they are suffered to remain out longer, but not more than two hours. They are fed in their stalls several times during the day, always giving them little at a time. In the afternoon they are again turned out and watered, and suffered to remain out as long as in the morning. The stalls having been again cleaned out and littered, the cattle are again tied up for night. Great care is taken to make the barn warm. When the weather is cold, the doors and windows are closely shut. In this way, the cattle being more comfortable, are kept at much less expense and thrive better. A cow will give more milk when kept warm than when exposed to the cold. Every farmer knows that cattle eat more in severely cold weather; and, notwithstanding, *then* cows give less milk; still few farmers take sufficient care to protect their stock from the severity of the weather. Hogs, also, gain more on the same food, when kept warm.

My business calls me often to ride through the county of York, and it is distressing to see seven eights of the stock (working oxen excepted) exposed to the severity of the weather in cold winter days, from morning till night, without shelter. Cattle so situated will take little exercise, but stand shivering with the cold, not being able to lie down comfortably on the cold, melting snow. It is a

mistaken notion that cattle and sheep should be much exposed to severe cold weather to render them hardy. Some farmers say that they leave their cattle out, because their business calls them from home. This is a poor excuse. It would be much better to turn their cattle out for water only once each day, and tie them up immediately after drinking, than to leave them all day exposed to the open air. Then the humane farmer, when gone from home and exposed to the storms of our inclement winter, may feel some satisfaction in the reflection that he has discharged his duty to his live stock, by placing them in a dry and warm shelter.

Respectfully yours, &c.

WM. A. HAYES.

S. Berwick, Me., Feb, 18, 1841. [*New Eng. Farmer.*

FATTENING HOGS.

This is an important process with the Western farmer, and coexistent with his earliest efforts. We would therefore suppose that he at least approximated the best method; but the practice of too many is not beyond the second step of improvement. The time for commencing it varies with different and the same individual, depending on the temperature of the season and the forwardness of the corn crop. We have already this season seen several lots which were very far advanced, and would be ready for the slaughter before the weather is sufficiently cool. Corn is the principal instrument. The hogs are permitted to run in the wood pastures, the clover and the stable fields, during the spring and summer, till a little before the corn is ready to be cut. They are then called up, and receive a small feed morning and evening—the whole plant, corn, stalk and husk is thrown to them, and little care taken to exclude the stock hogs from those intended to be fattened. The poo—o—ing of the man who has this in charge is one of the earliest signs of life in the morning, and the regular twilight vesper. Thus fed the hogs are permitted the usual range for some three or four weeks. They are then enclosed in an uncovered pen of rails made in the corner of or near to the field producing the corn on which they are to be fattened, and the feeding is commenced in earnest. As much corn as they will eat and waste, husked from the stalk and thrown into the pen, morning and night, without any further preparation and without regard to the condition of the pen; which, during the process, has the benefit of all the changes from mire, dust, and snow. It the pen does not include a part of a pond, they are turned out once or twice a day for water, and have the benefit of a long run to the pump or the nearest pond. This is the daily practice till the hogs are sufficiently fat, or the corn is exhausted. On the happening of either event, the weather permitting, the hog killing commences.

We are very much disposed to find fault with this practice. It certainly requires the least possible expense of labor, but that saving (!) is attended with a loss of triple its value in grain wasted unconsumed, and in the manner of feeding the hogs, and the state in which the grain is given.

The present scarcity of old corn creates a necessity of commencing on the green corn, if the fattening must be now undertaken; but independent of this unusual necessity, may defend the practice in the opinion that the nutriment obtained from the stalk, which the hog chews and sucks out the juice, more than counterbalance the increased food which might be obtained from the full ripe *ear*. This seems plausible, but must be erroneous, as it assumes the loss of the stock, which is not true. For whilst the greater portion of the green juice goes to pefect the ear, the stalk if cut seasonably and fed to the cattle, is quite as valuable to them as the mere juice of the green stalk can be to the hog. But the error does not stop here. Accurate, repeated and well conducted experiments have proved to our satisfaction that to fatten a hog with profit, he should be kept quiet, and therefore confined within a small pen which will shelter him from *inclement weather* and secure all *practicable cleanliness*, and should be *regularly* fed with as much food as he will eat *with an appetite, properly prepared*. This sentence describes, in short, the art of fattening hogs, which, fully to elucidate would require a volume. In support of it, we will however quote a few statements of facts.

It is the general opinion that the hog is a filthy animal. But "it is a great error," says Low, "to leave these animals in a state of filth and neglect. The hog is not a filthy animal by choice. He delights in a clean bed; he will wallow, indeed, in the mire like the elephant, the rhinoceros, and other pachydermatous or thick skinned animals, to which he belongs, but this is not because he prefers filth, but because he loves coolness and moisture." In support of this, we copy from "*The American Swine Breeder*:"

"Six pigs of the Norfolk breed, and of nearly equal weight, were put to keeping at the same time, and treated the same as to food and litter for about seven weeks. Three of them were left to shift for themselves as to cleanliness; the other three were kept as clean as possible by a man employed for the purpose, with a curry comb and brush. The last consumed in seven weeks fewer peas by five bushels, than the other three, yet they weighed more when killed by two stone and four pounds, (thirty-six pounds) upon an average, or six stone twelve pounds upon the whole."

From chemical experiments, two French chemists, M. M. Biot and Peroz, derived the following conclusions:

1. That the globules constituting meal, flour and starch, whether contained in grain or roots are incapable of affording any nourishment as animal food till they are broken.

2. That no mechanical method of breaking or grinding is more than partially sufficient.

3. That the most efficient method of breaking the globules is by heat, by fermentation, or by the chemical agency of acids or alkalies.

4. That the dextrine, (the nutrient part,) which is the kernel, as it were, of each globule is alone soluble, and therefore alone nutritive.

5. That the shells of the globules, when reduced to fragment by mechanism or heat, are insoluble, and therefore not nutritive.

6. That though the fragments of these shells are not nutritive, they are indispensable to digestion, either from distending the stomach and bowels, or from some other cause not understood, it having been proved by experiment that concentrated nourishment, such as cane, sugar, essence of beef, and osmazone, cannot long sustain life without some mixture of coarse and less nutritive food.

7. That the economical preparation of food, containing globules of fecula, consists in perfectly breaking the shells, and rendering the dextrine contained in them soluble and digestible, while the fragments of shells are at the same time rendered more bulky, so as more readily to fill the stomach.

The rationale of fermented food is thus stated by a correspondent of the Maine Farmer, who gives a satisfactory explanation of the advantage to be derived from fermented swill in feeding swine:

"Vegetable substances contain a large quantity of carbon, and this same substance enters also largely into animal materials, especially into fats and oils, constituting a large portion of these substances. It follows, therefore, that in animals, by the process called digestion, a portion of this carbon of the food is separated and assimilated or converted into chyle or blood, and from these into fat, muscle, or flesh, and such like materials which make up the animal body. But before the digestive powers can do this, the food must undergo a change, and the carbon contained in it be combined with something that will render it easily dissolved in the fluids of the body. Solid carbon is not dissolved in fluids. Charcoal which is one form of carbon, and indeed is nearly pure carbon, we all know is not soluble in fluids, but still it may be dissolved by adding another substance to it.

"To go back to our first remark, that vegetable substances such as are used for food contain a large portion of carbon, not in a pure state, to be sure, but mingled with many other substances which render it more or less liable to undergo fermentation. Now what is fermentation? It is nothing more nor less than this carbon combining with the oxygen of the air or atmosphere, being converted into air and escaping in the form of bubbles of gas as it takes its way up through the mass. The swill, therefore, that is in this state is ready to be dissolved in the fluids of the stomach and converted

into the animal body. If it is not fermented it will not digest so soon, and of course is not changed to fat so soon, and consequently the hog does not fatten so fast"

Hence, we infer the importance of boiling food *thoroughly* in as *much water* as it will *take up*. But this may be considered theory. Well, we have some practical experiments which we will give in our next number, from "The American Swine Breeder," a book we would recommend to every Kentucky farmer.

[*Kentucky Farmer.*

FEEDING ROOTS TO STOCK.

As a matter of economy those roots should be first fed to stock that are most liable to decay or to lose their good properties. The white flat, and globular turnips, generally lose some of their good qualities in a short time after harvested, therefore they should be fed out early.

In this class are the Early Garden Stone, the Norfolk, and the White Flat or Common English, which are rapid in their growth, and excellent in the fall and first of the winter, but they soon grow *corky* and depreciate.

Yellow turnips, whether flat, globular, or long, are generally hard and retain their properties through winter. The Ruta Baga or yellow Swedish turnip, where properly stored will keep well till in the spring, and the Cabbage turnips, that grow below the ground keep still better.

The Long Blood Beet and the Turnip Blood Beet soon lose their good properties unless unusual pains is taken to preserve them by packing in pure earth or sand as is sometimes practised with a few for table use. The Mangel Wurtzel retains its goodness very well, but the Sugar Beet is more firm and hard than any other beet and retains its properties the longest—even late in spring or till summer.

The carrot keeps remarkably well and may be had in good condition the last of May. The parsnip like cabbage turnips, will keep in a good state till spring, when vegetation commences. They keep well if dug in the fall.

Those kinds of roots, that are subject to an early decay, are most liable to heat and become injured by laying in a large body, without being aired, or having a chance to throw off the moisture and gases evolved in their decline, while such roots as keep well will lay in large bodies without injury.

Some farmers do not wash their roots for stock, but keep them dry and beat off the dirt so that but very little remain. They suppose a very small quantity will be beneficial to animals that are kept so long from the ground as is the case generally in our long winters.

Others think that dirt is injurious to the teeth of animals as well as a disadvantage in the stomach, and suppose that after a hasty washing, the roots will retain as much earth as is necessary. In England it is considered the better way to wash roots for stock as dirt produces scouring and injures the teeth. But there the winters are mild and cattle generally have access to the ground the most of the year.

When turnips are fed liberally to milch cows they sometimes impart an unpleasant taste to the milk, unless some precaution is taken to prevent it. A free use of salt on the roots prevents this evil in a great measure. Another precaution that can be practised conveniently, is to feed the cows on turnips as long as possible before milking, of course the proper way will be to milk at night and morning before giving this food to the cows.

Roots may be cut tolerably fine without much labor by putting them into a box and using a shovel or spade. A much better implement may be had at the agricultural stores for two dollars, it consists of two cross knives operated in the manner of a spade &c. As there are two cutters and one cuts across the other, it cuts fine and fast.

Several machines are constructed for cutting roots which are easily operated and they cut fine and with rapidity. Price from eight to twelve dollars. [*New Eng. Farmer.*

For the Southern Agriculturist.

OSAGE CORN.

Mr. Editor,—Noticing a high recommendation of the Osage Corn in the *Southern Agriculturist*, I directed my factors (Taylor, Lawton & Co) to procure me a small parcel of it for trial. They did so, upon the understanding, that half the product should be returned. I now beg to return you much more than half, from the quantity received, having retained for farther trial, but a small part, not more than three or four ears. My opinion of this Corn is, that it is not adapted to our climate, and could not be cultivated to advantage beyond the precincts of a garden. It is certainly not a sweet Corn, and does not deserve the character given it in your work. It will require sunning, or it will soon be utterly destroyed by the insects, being altogether a flour corn. It can never supply the place of our flint.

Respectfully,

Your humble serv't,

LEWIS R. SAMS.

Beaufort, Aug. 20th, 1841.

[We shall be glad to learn the result of the experiments made with this Corn in other sections of the State.—Ed. So. Agr.]

FALL PLOUGHING.

The "Practical Farmer" says, the more scientific opinion is in favor of *fall* ploughing, because to the action of air and moisture, it adds to that of *frost*, whose sceptic or dividing quality is second only to that of the plough itself. In clay soils the preparation should never be omitted; because on those the action of the frost is greater, and because one ploughing of *this* kind, may save two in the *spring*, when time is every thing.

The Monthly Genesee Farmer, vol. 1, page 180, in an article on this subject, says:

1st. It is one of the established principles of philosophical agriculture, that the soil derives much of its productive property from the air, and that chemical changes and combinations are constantly going on, by which fertility is much increased. These alterative effects of the atmosphere, and these changes of the qualities of the soil, are the more active and efficient as new surfaces are exposed to new action. For instance, much greater quantities of carbonic gas will be absorbed by a given surface of earth, if the earth is frequently stirred, than if it was allowed to remain with a single saturated surface. Ploughing, by exposing new surfaces to the action of the atmosphere must be productive of essential benefit; and as fall ploughing generally takes place after crops which have partially exhausted the surface of some of its nutritive and absorbent qualities, its service in aid of spring crops is greatly enhanced.

2d. There is always on land more or less grass, weeds, stubble, or other vegetable matters convertible into mould by fermentation and decomposition, a process which is greatly aided by being turned under the surface of the earth. Fall ploughing renders such substances much sooner available in advancing the growth of crops, than they would be if left uncovered during the winter, independent of the great loss necessarily sustained by the washing away of the lighter materials and their dispersion by the winds.

3d. Nothing acts more efficiently on moist soils in promoting vegetation, than high pulverization; and fall ploughing aids this operation most essentially. Lands that if ploughed in the spring only, will remain in large cakes or lumps, defying the efforts of the farmer to reduce them suitably, will, if ploughed in the fall, be found loosened in texture and fitted for early operations in the spring of the year. Frost is the most efficient disintegrator of the soil with which the agriculturist is acquainted, and he should avail himself of its available labors in all practicable cases.

4th. The earlier the ground can be prepared for the suitable reception of spring crops, such as corn, spring wheat and barley, the better it will be found for the cultivator; and in nine cases out of ten, early sown crops are the heaviest and most productive.

5th. Ploughing land acts more effectually in destroying insects than any other mode of treatment, and fall ploughing for this purpose is preferable to any other. Those insects which produce the most mischief to the farmer, such as the fly, cut-worm, grub, &c., cannot resist the frost of our winters, if prematurely exposed to its action by a fall ploughing. The cut-worm which accumulates in such numbers in old meadows and pastures, is thus destroyed, and crops planted on them saved.

Lastly—Our summers are so limited in duration, that unless the time allotted to vegetation is fully occupied by the growth and ripening of plants, the certain failure of crops may be anticipated. Hence the farmer usually is more hurried by his work in the spring than he ought to be, in order to avoid having his crops caught by the frost and snow. It should be the object of the farmer to have his necessary labor as nearly equalized through the season as possible, and thus avoid all pressures at inconvenient seasons of the year. Experience shows that the farmer in most cases, has more leisure hours in the fall of the year than at any other time, and he who would work it right, should employ this time in advancing his next spring's work, for such fall ploughing emphatically is, and thus preventing the pressure of business then usually felt.

On soils very porous, those composed of gravel or sand, in which, for the want of a retentive substratum, manures are apt to sink, and their good effects to be lost; or on lands liable to be washed, as side hills, where the finer particles of the soil are in danger of being carried off by every rain, or the melting of the snow, fall ploughing may not be admissible, but on most others we are confident its adnption will be attended with beneficial effects.

[*Western Farmer.*

UNDER-DRAINING.

The past month has been very unfavorable for out-door business, in consequence of the almost continuous rains. It has, however, afforded me an excellent opportunity to witness the benefits derived from *under-draining*. This branch of agricultural improvement is wholly neglected by most of our farmers, while there are no twenty-five acres of ridge-land lying contiguous, to say nothing of low or swampy grounds, but what some parts of it at least would be materially improved by draining.

With many persons, the discovery is yet to be made, that a super-abundance of water is as detrimental to the growth of most plants, as a stinted supply of this fluid. They admire that elevated lands should be wet; the reason is, they do not look *deep* enough—if they did, they would discover that the soil of most of our ridges rests upon a sub soil which is very tenacious, and as impervious to water, as a dish; consequently there is no way by which the water

falling upon the surface can escape, except by the slow process of wending its way through the soil to some less elevated place, or by evaporation, except it is by ditches, either covered or open. My remarks regard the former. After recommending a system, the inference will be that I have derived some benefit from it. I answer in the affirmative, and will state briefly my experiments.

I have an orchard, one side of which is wet, stiff land; rarely my water stands upon the surface, but for several months in a year the soil is completely saturated—so much so, that a hole dug a few inches deep will immediately fill. The trees did not flourish as well as on the more elevated parts; it occurred to me that it might be owing to the roots being so immersed in water. Accordingly, two years ago I caused thirty rods of ditch to be made, in different directions, all in the compass of half an acre, and terminating in one, and that in a low place, where I could witness the discharge, and the quantity surprised me. The favorable influence of the drains upon the land lying some distance off, as well as that in their immediate neighborhood, also exceeded my expectation. The effect upon the trees is decidedly favorable, and the grass is much sweeter and more abundant.

Again, I have a field of ten acres, in which I have made one hundred and fifty rods. This lot had always been occupied for grazing; some part of it was so wet (made so from springs) as to produce but little, and by far the greater part of a kind of knot grass, which indicates the coldest of land: will only *keep* animals, but not fatten them. The ditches had so favorable an effect that I determined to put the lot under the plough—that being my intention from the beginning, provided I could drain it. I have had two crops from it, and my experience is, that those parts of the lot, which were the most wet, have become by means of the drains the driest, and the soonest fit to plough after a rain, and producing the best crop. It would surprise any one to witness the quantity of water discharged, and that it is not interrupted in the coldest weather.

Now as to the size and expense of making. That will vary according to circumstances. I have made mine two feet wide, from eighteen to twenty-four inches deep The depth, however, is to be determined by the nature of the ground, and the kind of water to be drawn off. If surface water, when you meet the obstruction, (hard pan,) that is sufficient; if spring, deeper cutting may be necessary. The most expeditious way of filling the ditches is to dump the stones in; but the best way, and the one which I have practised, is to lay them in by hand, leaving an aperture or four or five incees square, just as the stones seem to favor. As to cost, I calculated twenty-five cents a rod; this is what I pay for digging and stoning. The drawing the stones I count nothing, as they can be disposed of in that way at a less expence than to draw them

into the highways, or to some distant ledge or broken piece of ground. The drawing the dirt on after placing the stones, is so quick done, that it need not enter into the expense.

The ditch should not be filled nearer than within six inches of the surface. Sods or straw should be laid on the stones previous to replacing the dirt. The quantity of water to be discharged, and the stones upon the land, will influence as to width and depth of the ditch.

I have made my article longer than I had intended when I began to write. I am not ambitious to make a display of my farming, but to elicit attention to, and promote agricultural interests. R. H.

Danbury, May 3, 1841. [*Farmer's Gazette.*

PLAISTER OF PARIS.

The great effect of this wonderful substance is visible to all, but the manner of its operation is mysterious. Among the various conjectures respecting it, some have pronounced it a powerful stimulus, which, putting all the vegetative powers of the soil in action, produces one great effort, and afterwards leaves the soil barren. This reasoning (if it may be so called) upwards of twenty years' experience has proved to be fallacious. Others, with great plausibility, have attributed to it an attractive property, whereby vegetable nutriment is extracted from the atmosphere; and some others say, mere moisture only is attracted; as a proof of this attractive property, they adduce the fact that dew is to be seen later in the morning on grass that has been plastered, than on the adjoining that has not.

This theory, (though apparently plausible) in my view, is not without insuperable objections. I would ask, in the first place, what change it undergoes in the soil, that disposes it to attract moisture more copiously than when above ground? I have not been many days without having some of it in a pulverized state in my possession, for several years, and have ofted looked in different kinds of weather for that effect, and have as often looked in vain. I have never seen any thing like moisture about the substance itself, nor the vessels that contain it, neither in damp nor dry weather, more than was common to other substances; on the contrary, I have sometimes dampened some to sow, and have found it inclined to dry very quickly. It is well known, that on lands where the proportion of clay is great, it has no perceptible effect. I have also found, as well as some others, that where applied to a fine mellow soil, the effect is very little; if it operates by attraction, why not attract here as well as in other soils? Certainly both would discover the good effects of a supply of moisture in a dry time.

I would suggest for consideration, whether, its effects may not be satisfactorily accounted for on the *principle* before alluded to,

as the *basis of agriculture*, a mere preparation of soil; without ascribing to it either stimulant or attractive properties, other than the promoting a fermentation in the soil, which may be called stimulant.

On a chemical investigation of the properties and composition of this substance, two things are discovered; first, that it is soluble in water, but that the solution is remarkably slow; and secondly, that it contains a very great proportion of vitriolic acid. In applying it to the soil, I have observed no visible effect takes place, until after some rain has fallen subsequent to its application; the finer it is pulverised, the quicker the effect and the shorter the duration; the fine dust blown from the hand at the edge of the sowing or between the casts, sometimes producing as great an effect the first season as any greater quantity, but entirely ceasing afterwards; while the middle of the casts, where most of the coarser parts fell, will show the effect for several years, giving the crop a striped appearance; that where the soil contains a large proportion of clay, it has no perceptible effect; and that on a fine mellow soil, the effect is but very little, sometimes not perceptible. These observations I expect, have been common to many practitioners; from which I infer, that it is first dissolved by the rains; that after solution, decomposition takes place in the soil, and the vitriolic acid being thereby set at liberty, to combine with any other base it may find in the soil, effervescence or fermentation (a well known effect of chemical combinations and decompositions) is from time to time produced; thereby separating the parts of the soil, and giving it the appearance and texture, which is common to all rich soils; and that this state always exists where the gypsum takes considerable effect on the growing crops, I am bold to assert. In general it is very visible on the surface, but always by passing through it with the plough.

I might here risk an opinion, why the application of plaster to clay, fails of exciting a sufficient degree of fermentation, to effect a separation of its parts; but as I by no means profess a critical knowledge of chemistry, shall leave it to others better versed in the science, to assign the cause, and only assert the fact, that by such applications the tenacity of the soil is not destroyed or any visible effect on vegetation produced. In an open mellow soil, great effects are not to be expected, because the state which the plaster is calculated to produce, already, in great measure existing, leaves it little to do.

But it will no doubt be queried how I account for the appearance before mentioned of the dew remaining longer on the grass, where the plaster has taken effect, than where none has been applied? To this I answer that it is not in consequence of the greater quantity falling thereon, but because it is more slowly evaporated.

Whoever will be at the pains to examine, will find, that this appearance is not confined to the plaster; but that grass growing on the ground made rich by any other means, will show the same difference, when compared with the same kind, growing on the ground alongside of it; or if observed when the sun shines after a shower of rain (when both must be effectually wetted without attraction) the same thing will be seen, and is easy to be accounted for on philosophical principles. The soil upon which the grass grows luxuriantly and retains the moisture is always of a darker colour and softer texture, than the poor soil adjoining: it being there more fitly adapted to imbibe the solar rays, they pass freely into it, while they are plentifully reflected back from the hard, light colored, poor soil, on the drops of moisture suspended on the grass, operating in the same manner as the rays of heat from a reflector placed behind roasting meat. Add to this that the grass always grows thickest on the rich soil, which will also contribute to prolong the drying operation.

Where this manure has great effect, it in some measure answers the purpose of *deep ploughing;* many having discovered that *washing* ceases where it is frequently applied with advantage to the crops. This is a certain proof that the soil is opened to a sufficient depth to imbibe the whole of the heaviest rains, and thereby prevents the accumulation of water on the surface: Hence we may safely conclude, that its operation continues much deeper than the usual ploughing. This is the secret which has prevented some Pennsylvanian improvers from discovering the necessity of deep cultivation. I have been told that some great *plasters users* when consulted on the subject of deep ploughing, have answered, that their crops have succeeded well with the usual depth, and therefore have not seen the necessity of going deeper, but let them cease to use the plaster, or confine their operations to a soil where its effects are inconsiderable, and then, after a fair trial of both methods, if they do not see cause to change their opinion I am very much mistaken.

Judging from the experience I have had of this manure, the judicious use of it is certainly to be recommended, while it can be had at the present low price. I prefer using it as a top dressing for upland grasses, at the rate of from three pecks to a bushel per acre. But those who substitute it for every other kind of manure and neglect all other means of improving their lands, will probably one day find that they are not so far advanced in agricultural knowledge as their present success may lead them to suppose.

[*Yankee Farmer and New-England Cultivator.*

MUCK—MUCK.

Almost every agricultural writer is inclined to ride some hobby. *We find ourself* inclined to bridle and saddle "*muck*"—to buckle on spurs and drive ahead. The way before us is *miry*, and we may get bespattered: but a little mud has had no terrors for us in days of yore, and we have no fears that we shall prove a coward in leading as many farmers as will follow us, to an attack upon swamps and muck holes.

These bog meadows are among the best lands in the eastern part of Massachusetts, and they contain in abundance, materials by which we may, and by which we *shall*, in a few years greatly enrich our uplands. These bogs are the most valuable part of our farms. This assertion is made deliberately. We are aware of its extent and its import. We have made it seriously, and we predict that not many years will pass away before its truth will be generally admitted.

Leaving at present all consideration of their worth for cultivation, we wish to draw attention to them as sources from which manure can be obtained. Muck, *properly prepared*, and spread over our uplands, will greatly enhance their fertility. "Stop, young man"—methinks I hear the aged farmer saying—"Stop, young man. I have used this muck, and experience tells me that it is sour stuff, doing often more harm than good to the uplands. Such is the lesson which *experience has often taught.*" We do not deny it—we do not doubt it; we know that it is true. Muck, as it comes from its bed, is often, is almost always, sour; it will impart of its sourness to the soil on which it is applied. This sourness is the natural product of the decomposition which the vegetable matters composing the muck have undergone. And until that sourness is removed, this meadow mud is not a manure; it does not furnish food for plants; but as soon as the sourness is removed—as soon as the acid is neutralized—this muck is nourishing to the crops that we cultivate.

How then can we remove the acid or counteract it? Exposure to the action of frosts and winds, rains and suns, will do much towards effecting the desired change. Farmers might do well to have three or four years' supply always on hand, and then not use that which has not had three or four years' exposure to the weather. But it is not necessary to wait thus long in all cases before we avail ourselves of the use of this article. We can, by the use of animal manure and lime, neutralize the acid of the muck in a few months or weeks, and thus more speedily enlarge our manure heaps.

The principles of making composts from muck, dung and lime or ashes, as recommended by Dr. C. T. Jackson, of this city, we gave in our report of his remarks at the State House; but deeming them most highly important, we make no apology for repeating them in our own words. Take one cord of dung and mix it thoroughly

with two cords of muck, that has been for several months at least, exposed to the action of the atmosphere. Then apply one half of a cord of muck to the outside of the heap, as a coating; pat this coating hard and smooth as you can with the shovel. If the whole be covered with straw or hay, this will be an improvement. Let the mass lie in this state for several months; to mix in the autumn and suffer to remain until spring, is a good course. Then, about ten or fifteen days before the manure is to be applied to the land, take one bushel of unslaked lime to a cord of compost. Slake this lime, but do it with so little water that it shall be a fine, dry powder. Now throw over the heap, mixing this lime well into the mass. Again coat the whole heap with another half cord of muck. The whole four cords in the course of two weeks will become good manure. The ammonia given out by the dung, will have neutralized the acid of the muck.

Heaps formed at this season may answer for use after the middle of May; though it would be better to allow a longer time. We make an earnest appeal to such farmers as have the materials in readiness to try this process and *adhere closely* to the rule. We wish to know distinctly whether science here is furnishing a valuable rule to guide us in our art.

Imagination carries us, reader, to your fireside, and hears you saying, "I'll try that, but I'll save some of the labor; I'll put my lime in when I first mix up the heap." It is our turn now to say "Stop, sir, stop."—We want before you go to work, to tell you that the great object is to neutralize (or counteract, or fix or destroy) *the acid in the muck*. The more ammonia you can extract or set free from the dung *at once*, the more effectually you will do your work. Now lime applied to dung *in its green state*, will not help to throw out ammonia half as fast as if the dung be *considerably decomposed* before the lime is used. If, then, you save the labor in the way proposed, you fail to get that large quantity of ammonia, at one time, which, if produced, would work like leaven through every lump and particle of muck in the heap and neutralize the acid.

"Well, then, Mr. Editor," you say, "I'll save labor by letting the dung get *considerably* decomposed before I go to work upon it, and then will put in both muck and lime at once." Do so, sir, if you please; but if you do, the winds will have carried much of your ammonia to Maine or to Georgia, before you begin to use it; and therefore the quantity of muck which your dung will change into manure is very materially lessened.

Let the dung, while green, be mixed with muck, because the ammonia which passes off in its first stages of decomposition, will then be saved and used. But do not put your lime in for several weeks, because its action upon dung that has undergone considerable change, throws off ammonia much faster than from fresh dung. The faster the ammonia is generated or set free at any one time, the more thoroughly it will penetrate the muck.

The *principal* use of the lime in this process is, to generate ammonia rapidly from the dung. This ammonia is the strong smelling effluvia or gas, that goes off from the fermented dung heap. The same substance is sometimes called *hartshorn*, and is used in ladies' smelling bottles. The great object is to generate or liberate *this* under such circumstances that it shall pass into muck and counteract its aid.

But does not lime itself, when put into the muck heap without dung, neutralize the acid? It does, as far as it comes in contact with the muck. Why not then use muck and lime alone, or muck and ashes alone, without putting in dung? Because in such cases, the lime and ashes act but little on any other parts of the muck than those which *touch* the lime or ashes. There is no steam—no gas—to penetrate the lumps and do the work thoroughly. But put in the dung—raise the *steam*—and the steam, if properly confined by the outside coating of the heap, will penetrate every lump and particle, and make the whole good for nourishing plants.

Urine will answer the same purposes of dung in this process of neutralizing acid. Ashes will answer in the place of lime. Loam may be substituted for muck, but is far less valuable.

Again we urge it upon farmers to consider this subject well; for we are satisfied that *the best manner of preparing muck* for use on our lands, is one of the most important practical questions now agitated by our agriculturists.

We will dismount now; but it will not probably be long before we shall bestride our hobby again. [*New-England Farmer.*

ECONOMY IN KEEPING HORSES.

ROBERTS, in his Agricultural Economy, maintains that one pair of horses, well kept, are a sufficient team to work a fifty acre farm, and to work it well, under the alternating system. It has been proved, he says, that a team going at the rates of a mile and a half and two miles an hour, will plough in nine hours as follows:

Width of furrow.	*Rates per hour*	*A.*	*R*	*P.*
8 inches,	1 mile and 1½	1	0	0
9 inches,	do.	1	0	20
8 inches,	2 miles,	1	1	10
9 inches,	do.	1	2	00

Three things require attention from every man who wishes to keep horses well and economically:

1. The food must be natural for them.

2. The quantity of food requisite to keep their condition equal to their work;

3. The best manner of giving their food, with a view of its being speedily eaten, so that they may lie down to rest.

The natural food for the horse, says our author, is corn, hay and grass; but that under artificial management, these may be advantageously substituted for natural food, or conjoined with it, potatoes, parsnips, carrots, turnips, and mangel wurtzel, together with straw, bean (and corn) stalks, pea haulm, vetches, clover and other cultivated grasses, cut green.

Hay is sufficient to keep a horse to look at, but corn is indispensable to enable him to stand hard work. A horse requires thirty pounds of dry food a day, of which a part must be corn or its equivalent; to those which work, one pound of good oats is equal in nutriment to three pounds of good hay. Heavy oats are worth more, pound for pound, than light oats, as will be seen by the following scale:

Wt. per bu.	*Produce in meal.*	*Produce in bran.*
42 lbs.	25 lbs. 2 oz.	16 lbs. 11 oz.
40 lbs.	23 lbs. 6 oz.	16 lbs. 10 oz.
38 lbs.	21 lbs. 12 oz.	16 lbs. 4 oz.
36 lbs.	20 lbs. 3 oz.	15 lbs. 13 oz.
34 lbs.	18 lbs. 11 oz.	15 lbs. 5 oz.
32 lbs.	17 lbs. 5 oz.	14 lbs. 11 oz.
30 lbs.	16 lbs. 1 oz.	13 lbs. 13 oz.

In general, the different kinds of grain are nutritious in proportion to their weight; while two pounds of green food or roots are considered equal to one of dry.

"Whatever fodder be used," says Mr. Roberts, "should be supplied in such a form as to be eat forthwith, that the poor animals should enjoy refreshing rest; to secure this, the fodder *should be cut or crushed*, and placed in a MANGER"—not a rack. When the respective feeds have been consumed, every horse will lie down to rest—his hunger being satisfied, there will be no temptation to keep him standing for hours as would be the case, were his rack stuffed with hay, according to the too general custom of farmers. The nutriment contained in every kind of grain depends upon its weight." It is to be remarked, that concentrated food, as grain; will not do alone, there must be something to increase the bulk to impart the stimulus of distention, before the functions of digestion can be carried on in perfection. Horses, therefore, and even fattening animals, which are fed high with grain, require cut hay, or even straw, for this purpose, independent of the nutriment they afford.

"When the quantity of hay supplied as before for horses," says Mr. R., "has been increased, and the quantity of oats diminished, it has been found that the animals, though they appear to improve, as to the fatness of their looks, were nevertheless not so liable to stand hard work; and, on the contrary, when the corn has been

increased and the hay diminished, it has been found that though the animals might, as to appearance, be leaner, yet that they were stronger, more equal to hard labor, and in better working condition." [*Buel's Cultivator.*

HOW TO IMPROVE A POOR HILL SIDE.

A red, poor, parched up, unproductive hill side, is one of the most uncomely features belonging to a farm. There are, however, many ways of enriching poor spots of land, but at present we will mention but three modes.

1st. In hauling stable manure, leaves from the woods, mould, and often by liming, poor land may be made quite fertile; but this mode is so expensive that it will admit of but small portions being improved. If land is enriched by the best stable dung, in three or four years the operation must be repeated, or swift deterioration takes place.

2d. By sowing several of the grasses on the same land, and grazing stock upon it, it may be enriched very fast. If this is the plan adopted, after grazing two or three years at most, the land might be turned over in the fall and sown in wheat or rye—if in the latter, it might be pastured till April, and then it would bear a corn crop. After taking off the wheat or Indian corn, if clover had been upon the ground, a good stand will soon appear. When this is the case, it may be grazed the second and third years, or if desired, a crop of hay may be taken off each season, and then it will afford some good grassing. By managing land thus, it may be made very rich in a few years, and yield a constant profit to the owner.

3d. We do not entertain a doubt, but Jerusalem Artichokes on hill sides, and exhausted spots of land, if eaten in the winter by hogs, will make land very rich. In the first place, Artichokes afford an abundance of foliage which shades the grouud in summer, and falls after frost, is covered by the rooting of the hogs, and rots in a short time. In the second place, swine give large quantities of the very best manure, while rooting after their food. We do not say that any one of the foregoing modes is to be adopted to the rejection of the rest, but all should be pursued as far as the farmer's means will permit. [*The Agriculturist, Nashville, (Tenn.)*

TO STOP WASHES AND FILL GULLIES.

It is quite astonishing to see many farms much injured by washes which might be stopped by very little trouble, if taken early, or if the right plan were pursued. Corn-stocks, brush, loose stones, old logs, or almost any kind of rubbish thrown into

ditches made by collections of running water, will have a salutary effect in preventing further violence, and frequently in stopping them entirely. Locust trees planted in gullies will soon take strong root, and eventually prevent further depredations. In addition to the advantage of putting an end to the wash in a few years, the farmer will have a delightful shade for his stock and valuable timber trees on his land. We have known *Herds Grass (Red Top)* sown in washes, and in a year or two, the roots had taken such strong hold as to prevent more injury. After noticing these items, each agriculturist will be the better able to judge of the extent of the gullies and washes in his fields, and apply the most suitable remedy. [*Ibid.*

HOW TO PRESERVE SWEET POTATOES.

Messrs. Editors,—I noticed, in the May No. of your periodical, an inquiry from my fellow-citizen and neighbor, Mr. Alsworth, as to the best mode of preserving Sweet Potatoes from rotting. In order to give others information at the same time I give it to him, I send you this communication.

Select a dry place, level the earth, and on the level place you make lay dry straw so as to form a circle of about six feet in diameter. On this straw empty the Potatoes until they form a cone about 4½ or 5 feet high. Over this cone scatter a little dry grass; and over that lay corn-stalks so that one end of them may rest upon the ground at the base of the cone and the other reach above its apex. Lay on just enough stalks to prevent you from seeing the pile through them. Then cover *the whole pile* with earth. Leave no air-hole on the top as is frequently done; but let the earth cover the pile entirely over at least a foot thick. A small shelter should then be made over the pile so as to prevent the rains from washing off the earth. This is usually done by inserting in the ground, around the pile, four forks on which rails are placed to support the shelter.

I have tried this plan for the last five years, and have not lost one pile during that time. I have invariably found the Potatoes as sound when I opened them as when I put them up. The gentleman to whom I am indebted for my knowledge of this plan, informed me that he had been putting up Potatoes in this manner for twenty years, and had not, during that time, lost any. He used dry pine bark instead of corn-stalks. I have, at this time, Potatoes which I put up in October last, and which are entirely sound. The secret of preserving them seems to consist in *keeping them dry and insensible to the changes of the weather.*

LEWIS M. GARRETT.

Canton, Madison Co., Miss., June 25th, 1841.

[*Ibid.*

HORTICULTURE.

AN OUTLINE OF THE FIRST PRINCIPLES OF HORTICULTURE;

BY JOHN LINDLEY, F. R. S. &C.

[Continued from page 487.]

VII.—SEXES.

186. The sexes consist of two or more whorls of transformed leaves, of which the outer are called *Stamens* (188.) and the inner *Pistillum*. (191.)

187. They are known to be modifications of leaves, because they very frequently are transformed into petals which are demonstrably such (149.); and because they occasionally revert to the state of leaves.

188. The stamens bear at their apex an organ, called the *anther*, which contains a powder called *pollen*.

189. When the anther is full grown it opens and emits the pollen, either dispersing it in the air in consequence of the elasticity with which it opens; or depositing it upon the stigma (191.); or exposing it to the action of wind, or such other disturbing causes as may liberate it from its case.

190. The pollen consists of exceedingly minute hollow balls, or cases, containing myriads of moving particles, which are the fertilising principle of the stamens.

191. The pistillum has at its base one or more cavities or *cells*, in which bodies called *ovula* are placed; and at its apex one or more secreting surfaces called *stigmata*.

192. The ovula are the rudiments of seeds.

193. If the fertilising power of the pollen come in contact with the stigma, the ovula in the cells of the pistillum are vivified, and become seeds.

194. But if this contact does not take place, the ovula cannot possibly be vivified, but shrivel up and perish.

195. The phenomenon of vivification takes place in consequence of the descent of a portion of the moving particles (190.) of the pollen into the ovula, where such particles form the commencement of future plants.

196. In wild plants a stigma is usually acted upon only by the pollen of the stamens which belong to it.

197. In this case the seeds thus vivified will, when sown, produce new individuals, differing very little from that by which they were themselves produced.

198. And, therefore, wild plants are for the most part multiplied from generation to generation without change.

199. But it is possible to cause deviations from this law, by artificial means.

200. If the pollen of one species is placed upon the stigma of another species, the ovula will be vivified; and what is called a *hybrid* plant will be produced, by those ovula when they shall have grown to be seeds.

201. Hybrid plants are different from both their parents, and are generally intermediate in character between them.

202. They have little power of perpetuating themselves by seeds; but they may, if woody, be perpetuated by cuttings (312.), buds (354.), scions (335), &c.

203. Therefore, no hybrids but such as are of a woody perennial character can be perpetuated.

204. It usually happens that the hybrid has the constitution and general aspect of the polliniferous parent; but is influenced in secondary characters by the peculiarity of the female parent.

205. This should always be borne in mind in procuring new hybrid plants.

206. Really hybrid plants must not be confounded with such as are spurious, in consequence of their origin being between two varieties of the same species, and not two species of the same genus.

207. Hybrid plants, although incapable of perpetuation by seed, are often more abundant flowerers than either parent.

208. This is, probably, connected with constitutional debility. (162.)

VIII.—FRUIT.

209. Fruit, strictly speaking, is the pistillum arrived at maturity.

210. When the calyx adheres to the pistillum and grows with it, to maturity, the fruit is called *inferior;* as the Apple.

211. But when the pistillum alone ripens, there being no adhesion to it on the part of the calyx, the fruit is called *superior;* as the Peach.

212. The fruit, is therefore, in common language, the flower, or some part of it, arrived at its most complete stage of existence; and, consequently, is itself a portion of a stunted branch. (153.)

213. The nature of its connection with the stem is therefore the same as that of the branches with each other, or of leaves with their stem.

214. A superior Fruit consisting only of one, or of a small number of metamorphosed leaves, it has little or no power of forming a communication with the earth and of feeding itself, as real branches have. (89.)

215. It has also very little adhesion to its branch; so that but slight causes are sufficient to detach it from the plant, especially at an early age, when all its parts are tender.

216. Hence the difficulty of causing Peaches and the like to *stone*, or to pass over that age, in which the vascular bundles that join them to the branch become woody, and secure them to their place.

217. For the same reason they are fed almost entirely by other parts, upon secreted matter which they attract to themselves, elaborate, and store up in the cavities of their tissue.

218. The office of feeding such fruit is performed by young branches, which transmit nutriment to it through the bark. (69.)

219. But as young branches can only transmit nutriment downwards, it follows that unless a fruit is formed on a part of a branch below a leaf-bud, it must perish.

220. Unless there is some active vegetation in the stem above the branch on which it grows; when it may possibly live and feed upon secretions attracted by it from the main stem.

221. But inferior fruit, consisting at least of the calyx in addition to the pistillum, has a much more powerful communication with the branch; each division of its calyx having *at least* one bundle of vascular and fibrous tissue, passing from it into the branch, and acting as a stay upon the centre to prevent its breaking off.

222. Such fruit may be supposed much more capable of establishing a means of attracting secretions from a distance; and, consequently, is less liable to perish from want of a supply of food.

223. It is therefore not so important that an inferior fruit should be furnished with growing branches above it.

224. Fruit is exclusively fed by the secretions prepared for it by other parts; it is therefore affected by nearly the same circumstances as flowers.

225. It will be large in proportion to the quantity of food the stem can supply to it: and small in proportion to the inability of the stem to nourish it.

226. For this reason, when trees are weak they should be allowed to bear very little, if any, fruit; because a crop of fruit can only tend to increase their debility.

227. And in all cases each fruit should be so far separated from all others as not to be robbed of its food by those in its vicinity.

228. We find that nature has herself in some measure provided against injury to plants by excessive fecundity, in giving them a power of throwing off flowers, the fruit of which cannot be supported.

229. The flavour of fruit depends upon the existence of certain secretions, especially of acid and sugar; flavour will, consequently, be regulated by the circumstances under which fruit is ripened.

230. The ripening of fruit is the conversion of acid and other substances into sugar.

231. As the latter substance cannot be obtained at all in the dark, is less abundant in fruit ripened in diffused light, and most abundant in fruit exposed to the direct rays of the sun, the conversion

of matter into sugar occurs under the same circumstances as the decomposition of carbonic acid. (141. and 279.)

232. Therefore, if fruit be produced in situations much exposed to the sun, its sweetness will be augmented.

233. And in proportion as it is deprived of the sun's direct rays that quality will diminish.

234. So that a fruit when exposed to the sun is sweet, when grown where no direct light will reach it will be acid; as Pears, Cherries, &c.

235. Hence acidity may be corrected by exposure to light; and excessive sweetness, or insipidity, by removal from light.

236. It is the property of succulent fruits which are acid when wild to acquire sweetness when cultivated, losing a part of their acid.

237. This probably arises from the augmentation of the cellular tissue, which possibly has a greater power than woody or vascular tissue of assisting in the formation of sugar.

238. As a certain quantity of acid is essential to render fruit agreeable to the palate, and as it is the property of cultivated fruits to add to their saccharine matter, but not to form more acid than when wild, it follows that, in selecting wild fruits for domestication, those which are acid should be preferred, and those which are sweet or insipid rejected.

239. Unless recourse is had to hybridism; when a wild insipid fruit may be possibly improved (204.), or may be the means of improving something else.

240. It is very much upon such considerations as the foregoing that the rules of training must depend.

IX.—SEED.

241. The seed is the ovulum arrived at perfection.

242. It consists of an integument enclosing an *embryo*, which is the rudiment of a future plant.

243. The seed is nourished by the same means as the fruit; and, like it, will be more or less perfectly formed, according to the abundance of its nutriment.

244. The plant developed from the embryo in the seed, will be in all essential particulars like its parent species.

245. Unless its nature has been changed by hybridising. (204.)

246. But although it will certainly, under ordinary circumstances, reproduce its species, it will by no means uniformly reproduce the particular variety by which it was borne.

247. So that seeds are not the proper means of propagating varieties.

248. Nevertheless, in annual or biennial plants, no means can be employed for propagating a variety, except the seeds; and yet the variety is preserved,

249. This is accomplished solely by the great care of the cultivator, and happens thus.

250. Although a seed will not absolutely propagate the individual, yet as a seed will partake more of the nature of its actual parent than of any thing else, its progeny may be expected, as really happens, to resemble the variety from which it sprung, more than any other variety of its species.

251. Provided its purity have not been contaminated by the intermixture of other varieties.

252. By a careful eradication of all the varieties from the neighbourhood of that from which seed is to be saved, by taking care that none but the most genuine forms of a variety are preserved, as seed-plants; and by compelling by transplantation a plant to expend all its accumulated sap in the nourishment of its seeds, instead of in the superabundant production of foliage, a crop of seed may be procured, the plants produced by which will, in a great measure, have the peculiar properties of the parent variety.

253. By a series of progressive seed-savings upon the same plan, plants will be at length obtained, in which the habits of the individual have become as it were fixed, and capable of such exact reproduction by seed, as to form an exception to the general rule; as in Turnips, Radishes, &c.

254. But if the least neglect occurs in taking the necessary precautions (252.) to ensure a uniform crop of seed, possessing the new fixed properties, the race becomes deteriorated, in proportion to the want of care that has occurred, and loses its characters of individuality.

255. In all varieties those seeds may be expected to preserve their individual characters most distinctly which have been the best nourished (243.); it is, consequently, those which should be selected in preference for raising new plants, from which seed is to be saved.

256. When seeds are first ripened, their embryo is a mass of cellular substance, containing starch, fixed carbon, or other solid matter in its cavities; and in this state it will remain until fitting circumstances occur to call it into active life.

257. These fitting circumstances are, a temperature above 32° Fahr., a moist medium, darkness, and exposure to air.

258. It then absorbs the moisture of the medium in which it lies, inhales oxygen (278.), and undergoes certain chemical changes, its vital powers cause it to ascend by one extremity for the purpose of finding light, and of decomposing its carbonic acid (279.), by parting with its accumulated oxygen, and to descend by the other extremity for the purpose of finding a constant supply of crude nutriment.

259. Unless these conditions are maintained, seeds cannot germinate; and, consequently, an exposure to light is fatal to their

embryo, because (278.) oxygen will not be absorbed in sufficient quantity to stimulate the vital powers of the embryo into action, for the purpose of parting with it again, by the decomposition of the carbonic acid that has been formed during its accumulation.

X.—SAP.

The fluid matter which is absorbed either from the earth or from the air is called sap.

261. When it first enters a plant it consists of water holding certain principles, especially carbonic acid, in solution.

262. These principles chiefly consist of animal or vegetable matter in a state of decomposition, and are energetic in proportion to their solubility, or tendency to form carbonic acid by combining with the oxygen of the air.

263. Sap soon after acquires the nature of mucilage or sugar, and subsequently becomes still further altered by the admixture of such soluble matter as it receives in passing in its route through the alburnum or newly formed woody tissue. (65.)

264. When it reaches the vicinity of the leaves it is attracted into them, and there, having been exposed to light and air, is converted into the secretions peculiar to the species.

265. It finally, in its altered state, sinks down the bark, whence it is given off laterally by the medullary rays, and is distributed through the system.

266. No solid matter whatever can be taken up by the roots; for this reason metals, which in the state of oxydes are poisonous, are perfectly harmless in their metallic state, as mercury; and this is, no doubt, the cause why liquid manure, which contains all the soluble parts of manure in a fluid state, acts with so much more energy than stimulating substances in a solid state.

267. The cause of the motion of the sap is the attraction of the leaf-buds and leaves.

268. The leaf-buds, called into growth by the combined action of the increasing temperature and light of spring, decompose their carbonic acid (279.), and attract fluid from the tissue immediately below them; the space so caused is filled up by fluid again attracted from below, and thus a motion gradually takes place in the sap from one extremity to the other.

269. Consequently the motion of the sap takes place first in the branches and last in the roots.

270. For this reason a branch of a plant subjected to a high temperature in winter will grow while its stem is exposed to a very low temperature.

271. But growth under such circumstances will not be long maintained, unless the roots are secured from the reach of frost: for, if frozen they cannot act, and will, consequently, be unable to replace the sap of which the stem is emptied by the attraction of

the buds converted into branches, and by the perspiration of the leaves. (XII.)

272. Whatever tends to inspissate the sap, such as a dry and heated atmosphere, or an interruption of its rapid flow, or a great decomposition of carbonic acid by full exposure to light, has the property of causing excessive vigour to be diminished, and flower-buds to be produced.

273. While, on the other hand, whatever tends to dilute the sap, such as a damp atmosphere, a free and uninterrupted circulation, or a great accumulation of oxygen in consequence of the imperfect decomposition of carbonic acid, has the property of causing excessively rapid growth, and an exclusive production of leaf-buds.

274. Inspissated or accumulated sap is, therefore, a great cause of fertility.

275. And thin fluid, not being elaborated, is a great cause of sterility.

276. The conversion of sap into different kinds of secretion is effected by the combined action of *Air* (XI.), *Light* (XI.), and *Temperature.*

(To be continued.)

VEGETABLE GARDEN.

PEA—(*Pisum.*)

Pisum sativum. The Latin name of *Pisum* is supposed to be derived from *Pisa* (a town of Elis), where peas anciently grew in great plenty: the latter name has been often before mentioned.

Peas, when green, are a pleasant and nourishing food; but they are considered somewhat flatulent; though this quality may generally be corrected by the use of mint. They are excellent in sweetening the blood, and in correcting scorbutic humors.

The following method of keeping green peas and French beans is given by a celebrated French author (Sonninis):—Into a middling-sized stew-pan, filled with young green peas, put two or three table-spoonsful of sugar, and place the pan over a brisk charcoal fire. As soon as the peas begin to feel the heat, stir them twice or three times, and when they yield water, pour them out on a dish to drain; when drained, spread them out on paper in an airy room, away from the sun, and turn them frequently, that they may be dry the sooner. It is necessary, for their keeping, that they should not retain any moisture; for if they do they will soon grow mouldy. French beans may be managed in the same way, and will thus keep till the next season, nearly as well flavoured as when first

gathered. Peas may be dried when gathered green; and are much better for soup than those gathered quite ripe.

As the two following very excellent dishes, made from green peas, may not be in the immediate recollection of young cooks, it will certainly augment the reputation of the gardener who recommends them.

The first is what has been frequently called delicious "green peas soup," made of "marrowfat" peas nearly full grown. For this purpose any of the new kinds (the old dwarf marrow being nearly lost) will answer; but none better than Knight's tall and dwarf green marrow, as the pulp which such peas produce is the principal thing wanted.

For making the soup, a good sized knuckle of veal will be required, which must be put into three quarts of water; and by the time this is reduced by boiling, to nearly two, the strength of the knuckle will be mostly drawn out; but previously to this, the peas (full three pints or more), after being shelled, should be put in to boil (some boil the peas separately), and, when sufficiently soft, the whole should be strained off, the peas separated, and the pulp rubbed through a fine sieve. The pulp should then be mixed with what the veal was boiled in, and the whole should again be put into the stew-pan, with the addition of a good Cos lettuce (either the white or Silesia), some "powdered mint," with the other seasoning of pepper and salt according to the taste. The whole should be allowed to remain in a moderate stewing state till the lettuce is thoroughly done, when the soup will be ready for table, with thin toasted bread: some advise a little ginger, but that is optional.

The second dish, which was a favourite and fashionable one some fifty years ago, is made of the sugar pea, when young, dressed with the pods entire, requiring only the outside edges to be stripped off. These are to be put into a stew-pan with some good gravy, thickened with flour and butter, with a little mace, ginger, and nutmeg, and allowed to stew gently until the pods are quite tender, as they are unlike any other sort of pea, not having a tough coating inside the pod. The sugar pea dressed after this manner, forms a most delicate side dish at the table.

There are numerous varieties and subvarieties of the pea at present in cultivation: each successive season generally ushers in new ones, which are of course proclaimed by their possessors as being very superior, and some of them really are so, as will be observed by the following notice of their qualities, &c.; but very many are found, after a few trials, not to have such excellent qualities as to recommend them for general cultivation: hence they soon lose their popularity, and, after a while, are seldom heard of.

1. Early Single-blossomed frame, a most excellent early pea, and very proper for gentlemen's gardens, where, if sown close to a

south wall in November, with some sort of shelter, such as yew, fir, or such like, and as they advance in growth kept close to the wall with lines of packthread, they will very early show bloom, when, after a few on each branch are opened, they may be topped. By this means the author has raised peas fit for gathering, above a fortnight before his neighbours. The usual height of this pea is from three to four feet; but as in this respect much depends on the weather and sort of soil, only the average height has been stated.

2. Early Double-blossomed frame, a chance variety of the former, possessing nearly all its good qualities, with the addition of a double bloom instead of a single one, which has rendered it so very popular for the first principal early crop, either in the field or garden. With both sorts hundreds of acres have been annually sown in the neighbourhood of Dartford, in Kent, for the supply of the London markets, during the season for which wagon loads in sacks are continually going night and day.

3. Early Warwick (of late introduction), an improvement of the double frame in the pod. It is certainly a good early pea, prolific, and averaging about the height of the early frame.

4. Early Charlton, or Golden Hotspur, a charming pea, if it can be had true, of which the author has his doubts. It was the leading early pea seventy years ago, and is still good to back either of the above sorts as a principal crop. It is a prolific bearer, growing from four to five feet in height.

5. Early Racehorse. This variety is of very recent date, and has already become very popular. It is very prolific, grows to the height of not more than three feet, and is particularly well adapted for a first crop, coming into bearing ten days or more before any other sort in cultivation.

6. Bishop's Early Dwarf. The name is very appropriate, as it does not grow (except in very warm and moist seasons) to much more than a foot in height. It is very early, most prolific, and, from its dwarfish growth, a first-rate pea for forcing: it requires no sticks for support, as a regular earthing will be sufficient. All other sorts of peas—at least such as are here described—are to be sticked, otherwise the taller varieties must be excluded from small and private gardens. Sticking not only, in a great measure, protects peas from the weather, but also causes them to produce a more regular and abundant crop.

All the earliest crops, more especially those intended for culinary use, require to be sticked, or they will not come nearly so early: but where large quarters or acres are sown, sticks are out of the question, and recourse must be had to a regular earthing, and the final laying down to one particular aspect, and if the lines or rows run from north to south so much the better.

7. Marquis of Hastings, a fine large pea, which grows to the average height of four feet, and comes in rather late.

8. Knight's Dwarf-wrinkled Marrow, one of the best of peas, and only exceeded by the following:

9. Knight's Green Dwarf wrinkled, without exception the finest pea in cultivation. Its average height is from three to three and a half feet; it comes late, is very productive, the pods being always very large and full, and the peas, when boiled, most delicious and well flavoured. The seeds of this variety are even sweet in their dry state, and are selected in preference to any other by the birds and mice: thus the saving of the seed is attended with considerable trouble, especially in cold ungenial seasons, and renders its cultivation very expensive, but its productiveness, tenderness, and delicious flavour amply compensate for every outlay.

10. Dwarf Blue Imperial, a very productive pea, tender and fine flavoured: average height three feet. It is, and deserves to be, extensively cultivated by the cottager and market gardener.

11. Royal Dwarf, of late introduction, is good, from the average height not exceeding two and a half feet. The pods come in clusters, and are very plentiful: it may be called a second early variety.

12. Groom's Superb Dwarf. This pea grows very dwarf, not exceeding one foot and a half in height; it comes about ten days after Bishop's Dwarf, and is equally tender and fine flavoured, with the advantage of boiling very green. It is in much estimation for small gardens and for forcing.

13. Scymetar-podded (so called from the shape of the pods) is a fine pea in taste and flavour, but does not yield quite so well as some others. It may be classed as second early, and averages three feet in height.

14. Green Woodford, or Nonsuch. This sort boils remarkably green, and is even greener in its dry state than any other variety. The height is three feet. It is very prolific, but the peas, unless gathered young, are not the most delicate, as they have rather thick and tough skin. It is an excellent market pea, and mostly cultivated as such. It comes in at the same time as the scymetar-podded.

15. Dwarf Blue Prussian, a well-known and excellent pea. At one time it was sadly run out; but, from the care taken by the seed-growers, it may now be had in its primitive state. These peas come late, which renders them most useful to sow with the early sorts in spring, and in the course of the summer, so that the luxury of a daily dish of green peas will not be wanting, as the tall marrows follow up so closely. Blue Prussians, when dressed, are of the finest green, and very tender: no other sort produces a more regular crop. The average height is about three feet.

16 Royal Victoria, a fine large marrow pea. From its recent introduction, the author has not been able to give it a trial, but he is informed it is of first rate quality.

17. Matchless Marrow. This is a large pea, very productive, and fine marrow-flavoured. It comes rather late, and grows from four to five feet high, and will therefore require tall sticks.

18. Blue Spanish Dwarf is very similar to Groom's Superb, as is likewise the Spanish Dwarf or Fan to Bishop's Dwarf. There is but little or no difference between them: they are mentioned only on that account.

19. Oyster Pea, so called from a singular roughness on the out side of the pods. It is a fine pea, and very useful for a late crop The average height is about four feet.

20. Waterloo, a fine large pea, and good for a late crop. It averages four feet in height, and is an abundant bearer.

21. Tall Marrow. This variety has long been cultivated in our gardens under the above name. It was formerly considered an excellent and delicious pea, but in consequence of the superiority of some other kinds, it has lost its high character, and is now but seldom planted.

22. Original Dwarf Marrow. Its height averages from four to five feet. It has been wrongly named, but it has gone by this appellation during the last century. The true sort is nearly extinct, as what is at present sold for the dwarf marrow, though a good pea, grows much higher than the original, and the seed is more round and smooth. The seed of the original sort was much larger, and the outside of the seed or pea had a rough coating. It was a most prolific bearer, especially when it had sticks to run on.

23. Dwarf Sugar Pea is of ancient date, having been first introduced from Holland above 100 years ago. It is a prolific bearer, and excellent for the purpose of stewing, as before mentioned. There is a tall variety of the sugar pea, but the dwarf sort has nearly thrown it on the shelf. The average height of the dwarf is from twelve to eighteen inches, or more.

24. Knight's Tall Wrinkled Marrow Pea, of high repute from its superior qualities. It would be more cultivated but for the large space of ground which it requires, and the great height of sticks, which are not at all times to be obtained, as they ought to be from eight to ten feet high.

25. Knight's Tall Green Marrow, of late introduction, is a most excellent late pea; and, if sown in the beginning of July, will keep in gathering till October. It is very prolific, and for all culinary purposes is in as high estimation as the dwarf variety.

26. Tall Imperial, a fine pea, but in no way superior either to Knight's Green Marrow or the Green Nonpareil. Average height from six to eight feet.

27. Nonpareil Marrow should be good from the name. It is a fine late and prolific pea, and should have a place with others of a similar nature. Average height from six to eight feet.

28. Egg Pea, so called from the large size and shape of the seed. This is one of the largest marrow variety at present in cultivation. It is certainly a fine pea and a prolific bearer, when it has sticks of a sufficient height to support it. The average height is from seven to eight feet.

29. Spanish Marotto, which, with the next mentioned variety, were leading peas at the first tables during the reign of George the First, but neither of them are at the present time in much repute. Still the Spanish Marotto will be found very useful where there is a large family to be supplied, as they keep in gathering some time longer than many other sorts, but they should have sticks, as the pods are large and generally well filled: the average height is frem five to seven feet.

30. Roundcival, an old inhabitant of this country. There are four varieties, but the white and green are the best. They are very prolific, and, like the Egg Pea and Spanish Marotto, very hardy, which qualities render either of them very beneficial to the cottager who can procure sticks to support them, such being absolutely necessary for their full production: the average height is about six feet.

One property in the Roundcival pea is, that it bears the droughts of summer better than most other kinds. Neither it, however, nor the Spanish Marotto, is so delicate eating as many others, and they are both now nearly out of date.

The author has been induced to enlarge upon the list of peas, in order that the public may be guided in selecting such sorts as they may deem most suitable for their gardens; he will only observe, to those who have but small gardens and wish to make the most of them, that No. 5. in the list may be selected for the first crops; Nos 10, 11, 12. and 15. for the second or medium crops; and Nos. 9. 16, 17. and 25. for the third or latest crops.

Culture.—The soil in which an early crop of peas is sown should be light, dry, and the more sheltered the better; and if it had been well manured the year before, so much the better, fresh dunged land being more an enemy than a friend to the peas sown upon it, as it causes them to run more to haulm.

The land for the later crops, or such as are sown from March to July, should be (if possible) of a more moist and holding nature; otherwise much labour must be bestowed in watering during the months of June, July and August.

For the method of raising an early crop of peas, as practised by the author some score years ago, the reader is referred to the description given of the frame pea, under the head of varieties.

There is another method, long practised, of sowing peas on warm borders either lengthways or across (the latter the most eligible), for which purpose the border should be laid on ridges of

two feet breadth at the base (on the warmest side, near the bottom, let drills be drawn about an inch and a half deep, not more at this season), and after sowing the peas, cover them carefully up when they are observed to break ground, which they generally do towards Christmas; when sown about the third week in November, they should in some way be guarded against their enemies, by strewing soot mixed with slacked lime over the rows, or finely sifted coal ashes; either will be a great check or preventive, as will also a light stirring of the earth on each side.

After being sufficiently up (for a first earthing say about an inch high), the sooner they are sticked the better, if only for protection, for which purpose two rows will be required; and on the side where the sun has the greater attraction, the sticks should be set thicker than on the other; and the advantage will be very considerable, if sticks can be procured whose length will extend a foot more than the average height of the peas; and as they should have a second earthing, the sticks will be no hindrance to it. In mentioning this subject, the author has to observe that the sticks, for every sort of pea that requires them, should be of a full height, and not set too close to the peas at the bottom, and by no means crossed at top, otherwise they lead the peas out of the way, and break down the pods when they begin to fill, thereby lessening the crop, and rendering it most inconvenient to gather.

The most sure season for sowing the early kinds of peas for a principal crop, is about the end of November, so that they are up by the end of December. But it frequently happens, should this crop survive, that the same sort of peas sown in the beginning of February will not be a week later than those sown in November, which they often equal in point of gathering.

The distance which peas require to be sown, from row to row, either with or without sticks, is various. The average height being ascertained, the distance can be regulated accordingly. Three feet will not be found too much for such as may be called the Hotspur, as likewise for some of the dwarf kinds of marrows, or any that do not exceed three feet, while such as exceed that length should have four feet space between each row, and the taller kinds full five, while the dwarf kinds, as Bishop's dwarf, the Groom's superb or Spanish, will not require to be more than two or two and a half feet apart.

There is nothing gained by sowing peas too thick; and, as observed in the former part of this work, the broader the bottom of the drills for sowing small seeds (particularly for peas of a small size) the better; they should only touch each other. The same may be said of the newly introduced dwarf marrows, and others of a similar height. For the tall and larger kinds of peas, particularly for Knight's tall wrinkled, the egg-pea, and such like, full an inch apart is required.

In respect of earthing peas: such as are to have sticks should have two earthings: the first when they are a few inches high; after the hoe is used between them, a little is to be drawn on each side; and the second, previously to their being sticked, when six inches high. Those intended to be laid down may also have a little earth drawn up on each side, but not so much as to draw them from the side where they are to be finally laid, which should be the warmest of the row, and the earth should be in sufficient quantity to keep them in that position, by which means not only will the peas be strengthened, but the wind will have less power over them.

Where a constant succession of peas is required, they should be sown more or less every three weeks or a month—from [November] to [April]; and, from the hint here given of sowing early and late sorts at the same time, a succession may be kept up, not only during the summer, but till October, and in some years until the middle of November; for it is a well-known fact (which the author has proved) that Knight's tall green marrow, sown about mid-summer, will produce a supply from the middle of September till the end of October, or longer, should the weather continue mild and open.* If it so happens that the weather is very hot and dry when peas are to be sown, the following hints should be attended to:—After the drills are drawn they must be well soaked with water, and the peas likewise, during the previous night, which will cause them to come up quick, and keep them in a regular growth; and if repetition of the watering is necessary, earth may be drawn up on each side the rows, which will contain water sufficient for the purpose, and not a drop will be wasted.

The following mode of sticking peas, and especially the taller varieties, is both cheap and simple, and possesses many advantages. Procure a number of strong thick stakes or thin poles, in length according to the height of the peas—from five to ten feet, and drive them into the ground on each side of the row, at the distance of three or four yards; pass a small line along the poles, taking a turn on each, within a few inches of the ground, and, as the peas advance, raise the next turn a little higher, and so on in succession till they have attained their full height. Seize the tendrils of the peas and twist them round these lines, by which they will be supported in a better manner than by the common method of sticking. When spread regularly along the lines, they have a fine circulation of air, and pods can be pulled at all times without injuring the haulm; and as the birds have no twigs to alight on, the portion of the crop which they otherwise would devour and destroy is saved.

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*[The directions are applicable only to England. With us Peas are seldom to be had after June. They may be sown for a fall crop in August and September, but the crop is uncertain.—Ed. So. Agr.]

An excellent way to preserve peas or beans from mice is to chop up the tops of the last year's shoots of furze, and sow them in the drills: the author has known it to have been an effectual remedy in several instances where these mischievous little animals had been very prevalent.

SUBSOIL GARDENING.

ALWAYS DO YOUR BEST, AND LEAVE THE REST.

Some people are afraid to look below the surface soil, apparently regarding it as a sacred spot that must not be disturbed or intruded upon. Now the fact is, too many of us have long been looking at the surface of things, instead of penetrating into the subsoil below and examining its texture, to see if a mine of wealth be not there secreted.

The period has arrived when gardening must commence, and those whose garden plots are underlaid with a stiff, tenacious subsoil, would do well by considering whether some measure might not be taken with it that would render it more certainly productive. It has been demonstrated beyond cavil, that when a tenacious subsoil is dug and loosened up, without bringing it to the surface, or mixing it with the vegetable mould of the surface soil; if the season is very wet, the water descends into it readily, and the plants are protected from the injury of their food being too much diluted with water; and if a drought comes on, the roots penetrate deeper, and are benefited by the reservoir of moisture which lies below; and the capillary attraction in the earth brings the moisture upwards to the surface, and feeds and refreshes the vegetables. Any way you may fix it, it does much good, like all those good, honest old rules, that work well either end foremost.

The way to work it is to dig a little gutter a spit deep and the width of the spade, along the side of a bed, and throw the surface earth which comes out of it to the other end of the bed which is to be dug, where it will be required for the purpose of filling the trench which will be left at the conclusion of the work. Then begin at one end of this gutter and dig it up, and turn it over *in the bottom*, from end to end; when this is done, begin and dig in the usual way, turning down the surface soil on to the subsoil which has just been dug; doing this from end to end properly, will leave another gutter, which dig and overturn as before; and so proceed till the bed is all dug two spits deep; the subsoil being turned topsyturvy, but none of it being brought up or mixed with the surface mould.

Trenching differs from this, in turning the whole over, and bringing the subsoil to the surface; but that would be inexpedient when the vegetable mould was not at least two spits deep, unless the ground should be very heavily manured.

Now what is the objection to putting a garden through this salutary process? None at all, excepting that it will require twice the amount of labor; and this may appear to some a serious objection, but its adoption once in four or five years may be sufficient, unless the soil is very stiff and intractable; and it enables the gardener, gradually every year to extend his diggings a little deeper into the subsoil, and by bringing up to the surface a small portion of it annually, the surface soil is constantly gaining depth, which is a matter of prime importance in obtaining good crops with much greater certainty.

Should it be too serious an undertaking to overturn a whole garden in this way in one season, try a single bed the coming spring, and become convinced of the importance of doing every thing you undertake in the way you are capable of; and then resolve never again to do any thing *well enough*, which means, in common parlance, just as bad as will in any way answer the purpose for the time being. The foregoing plan has no novelty in it, for it has been often done, with the greatest advantage resulting from it. There is no untried theory about it that need scare the most timid; and the writer does not expect to gain any thing further by the suggestion, than the pleasure of seeing many more good gardens, stocked with delicious, flourishing vegetables, than he has in times passed, witnessed. H.

[*Farmer's Cabinet.*

ANOTHER VARIETY OF TOMATOES.

We noticed some months since that some one of the officers of the Exploring expedition had sent to a friend in Philadelphia, a present of seed of the Tomato from the Pacific, whose fruit was said to be as superior to that of the Tomato now in cultivation here, as that is to the ball upon the Potato vine. If this new-comer is really so superlatively excellent, as we are a tomato-loving-biped, we should like to know of its present whereabouts. Were any of them cultivated in or near Philadelphia? If so, how did they turn out? Is there not some good friend of ours there, who would take the trouble of sending us a few of the seed. We think the first notice appeared in the U. S. Gazette. [*American Farmer.*

[We have a plant growing in our green house, and hope to give a good account of it hereafter.—Ed. So. Agr.]

THE FLOWER GARDEN.

MONOGRAPHY OF THE GENUS CAMELLIA, OR AN ESSAY ON ITS CULTURE, DESCRIPTION AND CLASSIFICATION.

BY THE ABBE BERLESE.

[Continued from page 497.]

Translated from the French for the Horticultural Register, by Henry S. Dearborn. *

SYNOPTICAL TABLE.

Indicating the color of the Camellia, its name, the form of its flower, the species or variety from which it was produced, the place of its origin, and the period of its introduction into Europe.

The * designates the species from which all the varieties have been obtained.

UNICOLORED FLOWERS.

PURE WHITE.

Name of Camellia.	Form.	Species or variety.	Origin.	Introduction.
Alba simplex,	reg. single,	single red,	Europe,	England, 1812.
" plena,	reg. full,	unknown,	Japan,	do. 1792.
Amabilis,	reg. sing.	single red,	Europe,	do. 1825.
*Axillaris vera,	irreg. sing.	a species,	China,	do. 1820.
Anemone fl. alb.	irreg. full,	warrata,	Europe,	do. Chandler.
Do. warrata carnea,	irreg. full,	warrata,	do.	do.
Candidissima,	reg. full,	unknown,	Japan,	do. 1830.
Compacta,	irreg. dble.	pink,	Europe,	do. Teoting.
Corvatheæfolia,	reg. dble.	unknown,	do.	do. 1833.
*Euryoides,	reg. sing.	species,	China,	do. 1830.
Excelsa,	irreg. dble.	single white,	Europe,	do. 1830.
Fimbriata,	reg. full,	unknown,	Japan,	do. 1816.
Gallica alba,	irreg. dble.	pink,	Europe,	France, 1830.
Granelli,	irreg. dble.	warrata,	do.	Italy, 1834.
*Kissi,	reg. sing.	species,	China,	England, 1325.
Lacteola,	irreg. dble.	warrata,	Europe,	Italy, 1830.
Nivea,	ir. semi d.	unknown,	do.	Belgium,
Nobilissima,	irreg. full,	pink,	do.	do. 1834.
*Oleifera,	reg. sing.	species,	Cochin China,	England, 1810.
*Oleæfolia,	reg. sing.	species,	China,	do. 1810.
Palmeri alba, or Pomponias f.	reg. semi d.	pomponia,	Europe,	do. 1815.
Do. plena,	irreg. full,	unknown,	Japan,	do. 1810.
Rollissoni,	reg. dble.	pink,	Europe,	Italy, 1813.
*Sasanqua,	reg. sing.	species,	China,	England, 1810.
Splendidissima,	irreg. full,	variety plena,	Europe,	Paris, Abbe Berlese,
Weimaria,	reg. semi d.	unknown,	do.	England,
Welbanksiana, or Heptangularis,	irreg. dble.	pomponia,	China,	do. Wilbancks.

* [Our limits will not permit us to give detailed descriptions of the several varieties. We, therefore, content ourselves by giving the above table.—ED. So. AG.]

FIRST GAMUT.

UNICOLORED FLOWERS.

CLEAR ROSE.

Dominant color. Lake mixed with more or less vermillion and Naples yellow, as in Nos. 2, 3, and 4, of the colored table.)

Name of Camellia.	Form.	Species or variety.	Origin.	Introduction.
Aitonia or Amplissima,	reg. single,	single red,	Europe,	Eng., Aiton,
Apollina,	irreg. full,	pink,	do.	France, Cachet, 1833.
Coloured,	reg. single,	single red,	do.	France.
Crouyoud,	reg. sem. d.	warrata,	do.	Belgium, 1834.
Dahliaflora,	irreg. s. d.	pink,	do.	England. Knight.
Expansa,	irreg. s. d.	do.	do.	England.
Fasciculata,	irreg. dou.	do.	do.	Italy, Milan.
Guessonia,	irreg. s. d.	single red,	do.	England.
Heterophylla,	irreg. d.	warrata,	do.	do.
Lindleya,	irreg. s. d.	single red,	do.	do. Lindley.
Pæoniæ flora rosea,	irreg. full,	unknown,	China,	do. 1810, Hampden.
Pink,	irreg s. d.	single red,	Japan,	do. Middle, Miss Turner.
Perle des Cam.	irreg. f.	pomponia,	Europe,	do.
Pulcherrima or Roleni,	reg. doub.	aitonia,	do.	do.
Rosea plena,	irreg. d.	expansa,	do.	Germany.
Roseana,	irreg. full,	unknown,	do.	England.
Resplendens,	irreg. full,	unknown,	do.	do. 1833.
Simensis rosea,	irreg. dou.	expansa,	do.	do. Vauxhall, Nursery.
Spectabilis,	irreg. dou.	pink,	do.	Paris, 1830.
*Sasanqua rosea,	irreg. full,	species,	China,	England, 1826, Capt. Rawes.
Theresiana,	irreg. full,	pink,	Europe,	Germany,
Venosa,	irreg. full,	do.	do.	do.
Virginica,	irreg. full,	single red,	do.	England.
Viltonia,	irreg. dou.	pink,	do.	Belgium.
Wilbrohamia,	irreg. dou.	ringle red,	do.	England.

FIRST GAMUT.

CLEAR CHERRY RED.

Dominant color. Carmine lake, mixed with rose lake and vermillion, as in Nos. 1, 2, and 3, of the colored table.)

Name of Camellia.	Form.	Species or variety.	Orlgin.	Introduction.
Aucubæfolia,	reg. dou.	single red,	Europe,	England, 1818.
Amerstia,	reg. dou.	warrata,	do.	do.
Amœna,	reg. dou.	single red,	do.	Italy.

Augusta,	irreg. dou.	corollina,	Europe,	England.
Aluntii superba,	irreg. dou.	single red,	do.	do. 1820.
Buckliana,	reg. s. dou	anemonæ flora,		do.
Belle Rosalie,	irreg. dou.	pink,	do.	France.
Brocksiana,	reg. s. d.	do.	do.	England.
Belle Henriette,	reg. dou.	expansa,	do	France.
Berlesiana,	reg. dou.	coccinea,	do	Paris, Abbe
			do	Berlese, 1831.
Blanda,	irreg. dou.	warrata,		Belgium.
Boumanni,	reg. dou.	varieg. ple.	do	Abbe Berlese.
Celsiana,	reg. sing.	single red,	do	England.
Crassinervia or			do	
Crassifolia,	irreg. dou.	pink,		do.
Cliviana,	irreg. full,	papaveracea,	do	do. 1830.
Chamlerii,	reg. dou.	splendens,	do	do
Conchiflora,	reg. dou.	expansa,	do	do
Conchiflora nova,	irreg. s. d.	single red,	do	Milan.
Cramoisina Par-				
mentieni,	reg. dou.	warrata,	do	Pamentier 1833.
Charles Auguste.	reg. s. d.	do.	do	England.
Conchata,	irreg. dou.	pink,	do	Italy.
Colla,	reg. dou.	single red,	do	do
Carolus,	reg dou.	coccinea,	do	Germany.
Camtoniana,	reg. s. d.	pink,	do	England.
Decora,	reg. full,	coccinea,	do	do
Dorsetti or Partho-				England and
niana.	irreg. full,	rubra plena,	do	Belgium.
Dianthiflora,	reg. sing.	warrata,	do	do 1822.
Excelsiana,	reg. dou.	pink,	do	Belgium.
Exoniensis,	reg. dou.	varieg. plena,	do	England.
ElegansChandlerii,	reg. full,	corollina,	do	England.
Elegantissima,	reg full,	warrata,	do	do Chandler.
Elegans,	reg. sing.	single red,	do	Belgium.
Emperor d'Autri,	reg. dou.	coccinea,	do	Abbe Berlese.
				1833.
Florida,	reg. dou.	coccinea,	do	England.
Fascicularis,	reg. dou.	single red,	do	do.
Flaccida,	reg. simp.	single red,	do	Italy.
Fordii,	reg. dou.	unknown,	Japan,	England.
Fulgentissima,	irreg. dou.	pink,	Europe,	Belgium.
Formosa,	reg. dou	rubra plena,	do	England.
Formosissima,	reg. full,	varieg. plena,	do	Belgium.
Fraserii,	reg. full,	unknown,	Japan,	England, 1834.
Gigantea,	reg. full,	rubra plena,	Europe,	do.
Grandiflora,	reg. sing.	single red,	do	do.
Gloriosa,	reg. dou.	warrata,	do	Belgium.
Hallesia,	irreg. dou.	single red,	do	England.
Husseyussoni,	irreg. s. d.	coccinea,	do	do
Hosackia,	irreg. s. d	warrata,	America,	Floy.
Hibbertia,	irreg. s. d.	single red,	Europe,	England.
Herbertii,	irreg. s. d	single red,	do	do
Humboldtiana,	irreg. dou.	varieg. plena	do	Germany.
Hybrida colorata,	irreg dou.	pink,	do	Netherlands.
Imbricata,	reg. full,	unknown,	China,	England, 1820.
Insignis alba,	reg sing.	dianthiflora,	Europe,	England.
do. de Tat,	irreg. s. d.	pink,	do	do
do. rubra,	reg. sing.	anemonæ flora,	do	do
Iddebiana,	reg. dou.	unknown,	do	Belgium.
Knightii eximia,	irreg. s. d.	pink,	do	England.
Latifolia nova,	irreg. dou.	staminea sine,	do	do. 1830.

Lambertii,	reg. sing.	single red,	Europe,	Belgium.
Macrophylla,	reg. dou.	coccinea,	do.	Italy.
Miss Rosa,	reg. s. d.	pink,	do.	England.
Magniflora simp.,	reg sing.	single red,	do	Milan, Casoritti.
Mutablis,	reg. dou.	pink,	do	Paris, Tamponet.
Nannetenis,	reg. dou.	coccinea,	do	England.
New Imported,	reg. dou.	pink,	do	do.
Osburnea,	reg. sing.	warrata,	do	do
Oxoniensis,	reg. dou.	rubra simp.,	do	do
Ornata,	reg. dou.	coccinea,	do	do
Percyæ,	reg. sing.	single red,	do	do
Pencillata,	reg. s. d.	papaveracea,	do	Belgium.
Parthoniana,	irreg. full,	rubra plena,	do	do. Meens.
Preston-eclipse,	irreg. full,	pomponia,	do	England.
Paradoxa,	reg. sing.	single red,	do	do.
Pulchella,	reg. dou.	pink,	do	Belgium.
Pæoniæ flora rubra,	irreg. full,	unknown,	Japan,	England.
Parksii striped,	reg. dou.	coccinea,	Europe,	do
Palmerii rubra,	reg. dou	pink,	do	do
Plumaria,	reg. sing.	dianthiflora,	do	do
Reine des Pays-Bas,	irreg. s. d.	single red,	do	Belgium. Germany.
Radiata,	reg. full,	coccinea,	do	do
Rosa sinensis,	reg. full,	pink,	do	Eng., Vauxhall, Nursery.
*Reticulata,	irreg. s. d.	species,	China,	Eng., Captain Rawes, 1824.
Rubricaulis,	reg. s. d.	single red,	Europe,	England.
Rosa punctata,	reg. dou.	aitonia,	do	do.
Rosæ flora,	reg. dou.	single red,	do	Belgium.
Scintillans,	irreg. dou.	pink,	do	England.
Sericea,	reg. dou.	unknown,	do	do.
Superba,	reg. dou.	single red,	do	Italy.
Staminea simpl.,	reg. sing.	single red,	do	England.
Sophiana,	reg. s. d.	single red,	do	Paris, 1834.
Spathulata,	reg. sing.	single red,	do	England.
Thumbergia,	reg. dou.	corallina,	do	do
Triumphans,	reg. full,	pink,	do	do
Venustissima,	irreg. s. d.	warrata,	do	Germany.
Warrata striata,	reg dou.	pink,	do	Belgium.
Woodsiana,	irreg. s. d.	single red,	do	do
Woodtii,	reg. full,	pomponia,	do	England.

(To be continued.)

RANUNCULUS.

PLANTING OUT THE FULL GROWN TUBERS.

The bed intended for choice sorts should have the soil taken out about the beginning of October, to the depth of one or two feet. In the bottom of the trench thus formed, about the depth of half a foot of cow dung two years rotted, should be laid, and then fill in a compost of good rich dark loam, with about an eighth of rotted cow dung well broken and mixed, till it rises half a foot above the garden level, forming a rounded slope on each side from the middle.

It is indispensable that no unrotted turf nor fresh dung be in the bed, as either of these will cause the tubers to canker. If the same bed therefore is to be used for ranunculuses more seasons than one, when the tubers are taken up, dig the bed deeply so as to turn up the layer of rotted cow dung in the bottom, mixing it well with the upper spit. Potted dahlias, German asters, or other late-flowering plants, may then be put in till October, when another trenching should be given, and an under layer of rotted cow dung placed at the bottom. About four inches of the old soil may now be taken off, replacing it with fresh loam, on which the tubers are to be planted and covered with dry sand.

In selecting tubers for the principal beds, the middling sized are better than large ones, which are very apt to divide into offsets, and therefore seldom flower strongly. When a number of offsets are required, large sized tubers are consequently to be preferred

It is not advisable to plant the tubers either in holes or drills, as is no unusual practice. The best method is to mark with a rod lines at from four to six inches distance across the bed, and on these to place the tubers with their crowns uppermost at four inches apart in the rows, with some sand below and above each, as is done with bulbs. Over the whole about two inches of light soil should be laid.

The time of planting may vary according to the time intended for the flowers to blow. A bloom may be obtained the whole year by beginning to plant in February, and every succeeding fortnight. Those first planted will blow in May. Those planted in April will blow in July. Those planted in June will blow in September. Those planted in the middle of July will blow in October.

When flowers are desired to blow late in the season, let the bed not be raised above the garden level, for otherwise it will not retain enough of moisture. After planting in the manner just directed, give a good watering with lime water to destroy the worms. Well diluted cow dung water should afterwards be given till the leaves appear, when they must be carefully shaded from the sun from ten o'clock till four, and this must be continued till the flowers die off.

For an early bloom again, the tubers must be planted in September, protecting them with a frame, and they will flower in January and February. It will be advantageous in this case to select tubers which have been kept out of the ground at the previous planting season, as these will grow much quicker than those which have flowered the same summer. If some be planted in pots in August, and successively brought into the greenhouse, a bloom may be kept up from October till February.

It is best to plant the broad-leaved varieties about the end of October, or the beginning of November, and to cover them with

long litter, such as pease haulm, to protect them from frost. The narrow leaved sort again are best planted in February or March, the latter being more injured by severe weather, and the former being apt to become mouldy if kept out of the ground till spring.

THE ORCHARD.

FRUIT TREES.—TRANSPLANTING.

When trees are removed for the purpose of being transplanted, their roots should, if possible, be fresh and entire.—If these precautions have been omitted, their whole bodies and roots must be immersed in fresh water during 24 hours; and their tops must be lessened in proportion to the loss their roots have sustained. The sources by which they derive the nourishment which they receive from the earth, being diminished, the whole sap of the tree, and even its vitality, would otherwise pass off by transpiration.

October and November, and immediately after the first frosts have arrested vegetation, is esteemed the best season of all for transplanting trees. The peach, the plum, the cherry and evergreen trees do especially well, when planted early in amtumn. But where circumstances render it necessary, transplanting may be deferred till spring.

Where trees are transplanted in autumn the earth becomes duly consolidated at their roots, and they are ready to vegetate with the first advancement of spring.

The holes for receiving the trees, should be dug from four to six feet in diameter, according to the size of the trees usually transplanted, and eighteen inches deep; the yellow sub-soil should be cast out to this depth and replaced at the bottom with rich soil mixed with a portion of manure. The tree should generally be set about two inches deeper than it was before, but not deeper than this; the fibres should spread horizontally in their natural position, and the soil intimately and compactly placed about their roots; manure may be placed above and beneath, and on every side, but ought never to be suffered to come in contact with the roots, as it is liable in this case to corrupt and injure them; finish by treading the ground very hard. When evergreen trees are set, it is generally considered indispensable to pour a few gallons of water around the tree previous to treading hard the earth; finish earthing and tread hard an hour afterwards. This is an excellent and safe mode with regard to any tree.

Farmers, procrastinate no longer—now, *now* is the time. Set out this fall or next spring that orchard you have so long been talking of. Let the land lay well up to the sun—be under a high state of cultivation. If the subsoil is hard, and almost impervious to

water, and the land rather wet at times, put through the subsoil plough, or dig out the hard subsoil under your trees and supply its place with rich loam and soil.

Let your trees be well protected from the ravages of cattle, and the land be kept in tillage for several years—or all the time according to the nature of your fruit.

We recommend transplanting in the fall in preference to the spring. In the country, farmers are very busy in the spring, and can hardly find time to collect their trees, &c. On most of our farms there are many fine trees growing wild. These, there is time in the fall to dig up carefully and transplant—and may hereafter be grafted.

If trees are transplanted around mowing fields, a narrow strip should be kept under cultivation till the trees get well to bearing—and then the surface of the ground should be kept loose for two feet around the root of the tree, and three bushels of fine compost put round each tree in the fall, and spread round carefully in the spring; without this care it is in vain to expect fair marketable fruit.

If you intend to get your trees from a nursery, you can get better trees in the fall. They should not be large—from 5 to 7 feet high. The trees should be taken up with much more care than they are usually taken up in your absence by hired men at our large nurseries. They should be taken up with the roots as entire as possible, the broken roots cut off smooth—and the remaining roots placed down in their natural directions, and we think not lower in the ground than they were found; and no potatoes should be planted about the trees in the spring to starve them out—or manure put about the roots. In the fall, great care should be taken not to have the roots touched with the frost when they are taken up for transplanting and at no time is it best to let them remain long out of the ground. It is well enough to put coarse chaff or fine damp straw about the trees on the surface of the ground in the spring, but this will not do in the fall, for it will attract mice, which will injure trees very much by gnawing and girdling them.

Young farmers, anticipate the faltering step—the diminished strength of age—and lay *now* the foundation for an income from your farms, which shall leave you leisure enough in advanced life for social and religious enjoyments, while it will enable you, as it were, to live over again the brightest hopes and most useful periods of your lives. [*Ed. Cult.*

HOUSEHOLD AFFAIRS.

TO REMOVE INK-STAINS FROM TABLES.

Procure spirits of salt at the chemist's, and without adding any water to it for the purpose of reducing its strength, pour it over the ink-stains, one at a time; observe the moment when the ink disappears by the corroding action of the acid, and immediately pour over the place a quantity of clean cold water; wipe the table dry, and proceed in the same manner with the other stains until all are removed; then having oiled the table with raw linseed oil, rub and brush it as usual. [*The Magazine of Domestic Economy.*

ON BRUSHING VELVET.

The art of removing the lint, dust, and light matters adhering to velvet, consists in the proper mode of managing the brush. Take a hat-brush (not too soft, but having the bristles elastic, and returning at once to their original state after being pressed aside), hold it firmly under the palm of the hand, in the direction of the arm, and with the bristles downward, and pressing them first gently into the substance of the velvet, then twist round the arm, hand, and brush all together, as on an axis, without moving them forward or backward. The foreign matters will thus be drawn up and flirted out of the flock without injury to the substance of the velvet, and the brush must be lifted up and placed in a similar manner over every part required to be brushed. By this means velvet will be improved instead of deteriorated, and will last for years: indeed the writer of these remarks has had a black velvet waistcoat submitted to this process for ten years, and it is still, comparatively and in appearance, but little worn. [*Ibid.*

GARDENER'S CALENDAR FOR NOVEMBER.

VEGETABLE GARDEN.

Sow Peas, Cabbages, Radishes, Carrots, Spinach, Turnips, Parsnips, Lettuce, Beets, Salsafy. Plant Mazagon and Windsor Beans. Transplant Cabbages, Lettuce, Onions and Leeks.

Remarks.—The first crop of Peas may be sown about the commencement of this month, and a general crop towards the last, though it is best to defer this until the next month. The Dwarf Marrowfat and Dwarf Green Imperial are the best varieties for this sowing. The Asparagus beds should now be dressed and good supply of manure given. [*Miller's Planters' and Merchants' Almanac.*